WILLIAM WHITMAN COMPANY
INC.

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WILLIAM WHITMAN COMPANY, Inc.

Wm Whitman

WOOL AND COTTON

in all forms from

YARN TO FABRIC

WILLIAM WHITMAN COMPANY, INC.

Offices

Boston: 78 Chauncy Street *New York:* 25 Madison Avenue

Chicago: Continental and Commercial Bank Building

Philadelphia: 300 Chestnut Street

Mills

Lawrence, Mass.

Arlington Mills Acadia Mills

Monomac Spinning Company

Katama Mills

New Bedford, Mass.

Manomet Mills

Nonquitt Spinning Company

Nashawena Mills

South Carolina

Calhoun Mills, Calhoun Falls Mary Louise Mills, Cowpens

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WILLIAM WHITMAN COMPANY, Inc.

Following is a Condensed Summary
of its Activities

WOOL TOPS

Wool Combing on Commission
Cleansing by the Naphtha Solvent Process

WORSTED YARNS
MERINO YARNS
In All Counts, Grades and Kinds for All Purposes

COTTON YARNS
Combed and Carded
Gray, Bleached, Dyed, Mercerized
In All Counts, Grades and Kinds for All Purposes

WORSTED AND MIXED FABRICS
In Every Variety

COTTON FABRICS
In All Forms and for All Purposes

FINE GOODS
In All Cotton and in Cotton and Silk

TIRE FABRICS

THE "QUALITY" MILLS

The group of mills represented by William Whitman Company, Inc., by size, modernity and system commands a wide field of Wool and Cotton manufacture, from the yarn for practically every trade purpose to finished fabrics of actually unlimited variety. It includes also quite a range of silk manufacture. The system provides against duplication of product. Each mill has its own special business.

In Lawrence, Massachusetts, are:

The Arlington Mills, producing Wool Tops and Worsted Fabrics of all kinds.

The Acadia Mills, producing Processed Cotton Yarns, Mercerized, Bleached and Dyed.

The Monomac Spinning Company, producing Worsted and Merino Yarns.

The Katama Mills, producing Tire Fabrics and other heavy Cotton Fabrics.

In New Bedford, Massachusetts, are:

The Manomet Mills, producing high-grade Combed Cotton Yarns in the gray, in medium counts.

The Nashawena Mills, producing all Cotton, and Cotton and Silk Fabrics, both staple and fancy, and making any kind of design to order.

The Nonquitt Spinning Company, producing high-grade Combed Cotton Yarns in the gray, in fine counts.

The business now conducted by William Whitman Company, Inc., was originally established in 1887, although William Whitman, the president of the corporation, has served as treasurer or president or active director of the Arlington Mills since 1867.

During the twenty-six years from 1887-1913, the business was conducted by various partnerships of which William Whitman was a member and the guiding spirit. In November, 1913, the business was incorporated under the laws of Massachusetts.

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WILLIAM WHITMAN COMPANY, Inc.

The Capital Stock is . . . . { $7,500,000 Preferred
12,500,000 Common

OFFICERS

The Officers of William Whitman Company, Inc., are as follows:

President: William Whitman . . . . . Boston, Mass.

Treasurer: Nelson A. Hallett . . . . . Boston, Mass.

Assistant Treasurer: Alfred A. Whitman, 25 Madison Avenue, New York, N. Y.

Vice-President: Arthur T. Bradlee . . . . . Boston, Mass.

Vice-President: Malcolm D. Whitman . . . . New York, N. Y.

Vice-President: William Whitman, Jr. . . . . Boston, Mass.

Vice-President: Hendricks H. Whitman . . . . . Boston, Mass.

Clerk: Frank C. Chamberlain . . . . . Boston, Mass.

DIRECTORS

Arthur T. Bradlee . . . . . Boston, Mass.

William W. Coriell . . . . . New York, N. Y.

Louis H. Fitch . . . . . Boston, Mass.

Nelson A. Hallett . . . . . Boston, Mass.

Frank E. Leaycraft . . . . . New York, N. Y.

George H. Waterman . . . . . Boston, Mass.

Hendricks H. Whitman . . . . . Boston, Mass.

Malcolm D. Whitman . . . . . New York, N. Y.

William Whitman, Jr. . . . . Boston, Mass.

William Whitman . . . . . Boston, Mass.

Eight Rules Adopted for Guidance in Conducting our Business

THE RULE OF HONOR

The fundamental principles of permanently successful business are the same now as yesterday, and will remain the same forever. The undertaking that is based on wrong principles has decay at its heart, and cannot last. Honor is the one and only true basis on which an enduring mercantile edifice can be reared.

Character and Honor are synonymous. Character has been described as the power to make talent trusted. Our country's vast volume of business, so immense that it cannot be comprehended in its entirety, nor conveyed to the mind by statistical exhibits, is conducted in part without written contracts of any kind and in larger part under contracts that though written may not always be legally binding. Their validity depends on the man who makes a contract, rather than on contracts themselves.

Even a legal contract is ever subject to sophistical interpretations or evasions if any party to it is so minded. The reliable quality of any form of agreement is not its letter, but its spirit; and there is no guaranty of that spirit except the character of the men concerned in a transaction.

To make any statement that is only literally and not morally true; to make any agreement or promise without full reason to believe that it can be made good; to distinguish as between the obligation expressed in a note and the moral obligation of any maturing debt of any kind; to undermine the integrity of a national industry by insidious depreciation of quality in product—these are the sure enemies of reputation and credit. The rule of honor commands faithful performance. It dictates that we shall be always ready to risk financial loss rather than to lose our self-respect.

Maintenance of so high a standard of mercantile honor is essential to the credit which binds business intercourse. Our material prosperity both as individuals and as a nation is absolutely dependent on it. Our great achievements of industrial science and our triumphs of business enterprise could not have developed without conditions that justified trust; and even if they could have developed, they could not

in themselves have made the America of today. Honor is the very life of it. It is the background of our present, and the assurance of our future.

It has been my fortune to know the America of the past. I well remember the great wool-spinning wheel which stood in my grandmother's kitchen and supplied all the yarn for the family home-spun. I have seen America grow out of that era of pastoral self-help through the eras of wood, iron and steel, from hand and water power to steam, gasoline and electricity, and from individual localized industry to vast production in concentrated mass. Yet in all these changes, astounding almost beyond belief even by myself who have played a part in them, I have seen no change in the simple rules that dictate the conduct of men toward each other. Profit is the practical measure by which we must estimate success in the methods of business; but the success of American commerce and industry would be ephemeral indeed, if it were merely a money success. The true success is in the integrity of the whole great structure.

The measure of our honor is the pride that we can take in the structure we have helped to rear. Business demands heart work as well as head work. Ideals in business are not unpractical. They are good business. America has become what it is by continually turning ideals into realities; and duty and self-interest impel us to continue this work of making a practical tomorrow out of the ideal of today.

The high ideal before business today is increasing service. The future of business will be determined by the degree in which it meets that duty by making itself increasingly useful to all, whether they be investor or worker, producer or consumer. Good will must be more than passive in these coming years. It must be the great dominant energizing factor in all relations.

The mills and the organizations represented in this book have tried since their inception to practice the rules of co-operation between themselves and their employees. There has been much to do and there remains much to learn. Their ideal has not yet been attained. What may have been accomplished thus far is, indeed, only a part of what they hope to do as they find themselves able to solve the necessary questions of practical ways and means. We feel that this spirit of co-operation between all, and especially between the employers and employees, can and will be strengthened by time, growth and honest effort.

1921 WILLIAM WHITMAN

THE RULE OF SERVICE

The business principle of the organization looks beyond manufacturing and marketing. The user's success in working the product easily and economically is the thought that governs mill processes.

The technical departments do not consider their work done when they solve their own problems of manufacture. They study the problems of the customer, and endeavor to solve them before the product reaches him.

Through the group there is the purpose to ignore no difficulty, whatever it may be. That means in plain language, not to pass troubles on to the customer.

Any new use that develops for yarns, textiles, fabrics or other mill product immediately becomes a mill study and every resource is mobilized to make the best material for the purpose.

The three mottoes of the Whitman Company group of mills are:

"Where Quality Counts"
"Tell Us What You Want and We Can Make It"
"Skill Wins Favor"

The executive departments and the offices of the William Whitman Company in Boston, New York, Philadelphia and Chicago maintain continual telephone communication with each other and with the mills, this instantaneous method having long replaced the mails for the organization's transaction of all except minor and routine business. The practice produces not only quick action but welds all the establishments into one well-informed alert whole, accustomed to prompt decision.

Administrative departments have been formed primarily to increase service to customers. One of the very effective ones is the Transportation Department which is in daily communication with all managements of the American railroad system in order to insure the quickest and most economical deliveries. In cases of interrupted freight movements over customary routes this department seeks open gateways and if necessary obtains additional or unusual facilities for hurrying merchandise either by freight or express. Owing to its comprehensive information, it often succeeds in diverting freight in event of untoward conditions after shipment, and has managed many times to save customers from the loss accruing from idle machinery.

Prepayment of freight charges is another service adopted to save customers expense both of money and of the time and energy wasted

in checking freight vouchers and collecting petty overcharges. A system for promptly crediting customers for goods lost or damaged in transit saves them similar tedious settlement of claims and also relieves them of the burden of having perhaps large sums outstanding.

Tracing delayed or astray shipments is attended to in a decisive way and not by the perfunctory method of simply filing a request with the carrier. The shipment is found and expedited, and a complete system of shipping marks, car numbers and other records aids the work.

Another service staff is in the Statistical Department which in addition to gathering general information about raw material and textiles, keeps close records of customers' special needs or preferences in regard to packing, shipping and other details, and of all products ever made for them.

A Testing Department in the Boston premises of the William Whitman Company is equipped with the latest devices for textile research and for testing raw cotton, wool, and silk, or yarns and fabrics, for quality, grade, counts, twist, elasticity, breaking and tearing strength, abrasive resistance, construction, color, etc. Among the instruments are a vertical combination yarn and fabric breaker, a single strand breaking machine, a skein breaker, a horizontal fabric tester, and full sets of instruments for determining twist, thickness, and other fine details. All operations are under the same humidity control used in the mills and the entire laboratory is sealed in glass against the outer atmosphere.

THE RULE OF QUALITY

Quality is the one standard of these mills. "Where Quality Counts" is not simply a selling phrase. It is a law. It dictates every procedure from the purchase of raw cotton and wool to the delivery of a finished product to a customer.

Every mill grade, quality or brand represents an established and definite standard of quality, from the raw material to the finished article.

This standard is invariable, no matter how the conditions of the world's raw material may vary at any time. If a mill should at any moment find it impossible to get the quality of raw material established for a given product, that product would be withdrawn for the time.

So long as a Whitman's mills' grade is on the market, it maintains exactly the standard set for it, and its quality is uniform year by year.

The brand on a mill product is not a mere trade-mark. It is a pledge.

There is in operation the sharpest distinction between *economy* and *cheapness*. It is recognized that quality costs money, and that this money-cost is not simply here or there, but must run through all the processes, beginning with the purchase of the raw material.

Intense application of all possible manufacturing economies is made to obtain results at the lowest possible cost; but Quality comes first.

Hence there is in these mills the apparent paradox that though they are notable for economy of operation, they pay more for raw material, maintain a higher percentage of wasteage and expend more than most mills on all processes. But the money is spent where it produces something; and the economies are applied where they cannot affect quality.

THE RULE OF UNIFORMITY

The value of a wool or cotton product to the weaver, knitter, converter and other user is decided largely by its uniformity. Unequal quality, even though it touches high quality now and then, is in its final effect a low quality, for it deranges operation and produces constantly varying results. The Whitman group of mills has developed all methods to secure absolute *Uniformity* as well as *Quality*.

Every department in each mill has its own testing service which remains in continuous touch with the product while it is in process. These separate services are under the controlling supervision of the central laboratory in each mill. As a court of final resort there is maintained in the Boston offices at No. 78 Chauncy Street, the central bureau which is believed to be one of the most complete yarn and textile testing laboratories in the country.

Product is accompanied throughout its entire course by a system of record and identification whose leading principle is to imbue the work of the mills with personal responsibility. Being developed to the point that enables the mill executives to trace any individual put-up back through every machine, it is a permanent insurance against defective operation anywhere in the equipments. In addition it assures accuracy in filling each order.

THE RULE OF CO-OPERATION

The mills are each under separate management and under distinct ownership, and they are rivals for economy of production and

excellence of output. They work, however, under one large plan of scientific operation, and each mill is made the beneficiary of every technical improvement developed anywhere in the group.

The effect is to make the group one great establishment with the facilities of many. The mills avoid duplication of product, and instead, supplement each other at every point. It is not specialization in any narrow sense. In the regular run of operation each mill concentrates on certain manufactures, thus bringing to bear the maximum degree of expert knowledge and care; but it retains full scope as an independent establishment.

This point should be remembered in referring to the detailed description of mill products in this book. Widely varied though they are, they are the result of one harmonious system and principle—integrity in selecting raw material and in working it, a scientific development of quality, and the best obtainable equipment, human and otherwise.

The group of mills is not only fit to work in. It is fit to live in. The statement is made here not as a matter of self-approval, but because it is a business fact of significance to customers.

The quality of any product is inseparable from the conditions under which it is manufactured. The best machinery is inefficient except under the best human management. A trained worker's faithful attention is necessary if a thing is to be made as good as it can be made.

Such intelligent attentiveness can neither be attained or expected from workers whose circumstances make for discontent or whose tenure of work is insecure. Unsystematic stoppages that cause shifts or loss of operatives are destructive of efficient production. In this group of mills the first importance attaches to close co-operation between the selling, buying and manufacturing departments in order to so maintain operations that workers shall have permanent employment, and that all departments of manufacture may profit from trained operatives whose experience is not wasted by shifts or displacement. It is easier for a rich mill to buy fine machinery than it is to create a contented and efficient working force. The figures of these mills demonstrate that maintenance of steady employment under comfortable conditions has effect on both quality and quantity that cannot be obtained otherwise.

With such an organization, the labor of maintaining uniform standards is appreciably lessened, for there is a minimum of trouble from careless work. The executives have leisure and energy to consider problems, and to experiment for improvements.

THE RULE OF CLEANLINESS

The time has gone by when dirt was considered a normal element of industry, and cleanliness only an unbusinesslike fad designed simply to please the eye. Because dirt is expensive and cleanliness is good business, the Whitman group of mills are kept permanently white inside with fresh paint and enamel; every possible form of dust is removed by blower installations; cleaners with motor-driven scrubbing machines, chemicals and other appliances work as constantly as does the force at the production end; and instead of trampled earth and coal-dust, gardens and lawns surround the buildings.

It is true that the expense of cleanliness and paint is heavy; but every modern industrial improvement costs money. An advantage of brightness that cannot be measured in dollars, is its result on product. In an industry that deals with the thinnest, most attenuated material, ample light is a decided factor in quality. Therefore, the Whitman group of mills considers natural light a raw material almost equal in importance to its cotton, wool and silks. Its value runs through every process. Every place in the mills has direct daylight, so that the most minute defects are visible.

The direct effect of cleanliness on product is obvious. No dirty overhead drives accumulate oil and dust to be dropped on the material under manufacture. If raw material, rovings, yarns or fabrics accidentally fall, they fall on a floor where they get soiled as little as if they lay on a clean table. By keeping machinery clean, the mills eliminate the trouble caused by spattered oil—a fruitful source of loss to users, since the spattering from a dirty spindle is invisible in detail and therefore may spot thousands of yards of material.

This strenuous system of cleanliness was considered extravagant when it was first instituted. But the mills have so profited from it that they are not only maintaining it, but continually seeking to accentuate it. One notable effect of it, is the effect on the workers. The past years have demonstrated that the old proverb "Like master, like men" may be paraphrased into "Like mill, like men." Slovenliness has practically disappeared from every mill in the group.

To customers this means not only that they get a good product. It means that they have to pay only for effective work. They benefit in dollars from the fact that there is little waste in cotton and worsted yarn manufacture due to defects: that as the raw material passes through the mills it becomes progressively cleaner instead of gathering

new dirt: that the finishing departments do not have to wash or scour fabrics nearly as much as if the mills were less punctilious about cleanliness.

If a mill is dirty, mill dirt is part of what you buy. You have to pay for it. Mill cleanliness, on the other hand, is a dividend shared by you.

THE RULE OF HYGIENE

While the attitude of the Whitman group of mills toward welfare of workers has been dictated primarily by business reasons, it has proved itself to be of eminent industrial soundness. Had they achieved nothing else, it might still be considered that they had made an important contribution to American industrial science by proving the fallacy of the old contention that workers are irresponsive to the employer's good efforts.

A suggestion to cut down expenditures for hygiene and comfort would be considered by the managements of these mills as absurd as a proposal to cease buying new machinery. As already said, sanitation and brightness make for satisfactory operation and enhanced value of product. Massachusetts State officials have reported that these mills provide as healthful conditions as the public schools. As a matter of actual statistics, the establishments have nearly double the amount of fresh air required by the State laws for school children. The space given to the workers is nearly ten times that demanded by law for schools.

The air is purified and kept in constant circulation. Standard bubbling fountains are placed everywhere among the machines, giving all workers convenient access to water that is filtered and cooled to the temperature recommended by hygienic science. A very practical benefit is that work is not interrupted by the illnesses that overcome factory operatives who have access only to crudely iced water.

Each mill has its own emergency hospital with beds, under trained nurses who have at their command the facilities for aseptic surgery and for medical relief. These nurses also superintend the general sanitary condition of the entire establishments.

Besides dressing-rooms there are individual metallic lockers for each employee. Women and men attendants maintain wash-rooms, etc. in good condition.

So thoroughly have these matters demonstrated their utility, that there is lively rivalry between the various managements for improvements. A suggestive point is that men who had spent a great part

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of their lives under other conditions, are the most enthusiastic upholders of the regime of these mills, and foremost in suggesting further innovations. Such an idea as installing coffee boilers and ovens for warming and cooking luncheons, for example, was eagerly adopted, and in the Arlington and Acadia Mills has been so extended that each floor has an equipment of its own, with a woman attendant to look after the food.

THE RULE OF VIGILANCE

One of the characteristics of cotton and woolen mill operation is the incessant tendency to variation of product. Minute variation in the raw, slight changes in temperature and humidity, variations in the adjustments all have instant effect on the tender material in its long course through the intricate processes that convert it from a bit of fluff to a finished product.

Everywhere, anywhere, at any moment, some such variation may begin to alter the character of the entire product. Practically every day develops some new problem in a mill, presenting itself in a form that puzzles the most experienced. The yarn may run uneven in size. It may show a sudden mysterious alteration of tensile strength. Its appearance may be impaired. It may run too heavy or too light.

These difficulties are not abnormal in the sense that they are outside of the normal day's work. They are an inseparable part of the regular daily operation, and "eternal vigilance" is indeed the price that must be paid for safety in quality.

Automatic machinery may, and does, catch many imperfections. To install such devices is a matter of common manufacturing intelligence. But machines cannot exercise vigilance. Vigilance is a matter of human eyes, human brains, and more than all, human conscientiousness. To maintain these qualities at their best, it is essential to imbue the working force with the spirit of the mill. The policy of the Whitman group guards against temporary idleness of machinery which involves dismissal of operatives, and avoids those changes of equipment from one manufacture to another, which cause wasteful transfers of trained people.

Thus, while these mills maintain many systems of checks and safeguards to place individual responsibility, they assure vigilance by better methods than penalties. The organization's good will towards its customers and its good will toward employees, demonstrated by action through many years, have imbued the working force with good will for the mills' products. The operatives are vigilant because they want to be.

"CLIMATIC" CONDITIONS

The regions occupied by the Whitman group of mills (Lawrence in the northeastern end of Massachusetts, near the seacoast, and New Bedford in the southeastern part of the State on Buzzard's Bay, where the Gulf Stream swings near the coast) closely approximate the ideal climate for cotton and wool manufacture; but even their humidity and temperature are not sufficiently uniform to be accounted completely right.

For this reason the group has made itself wholly independent of natural climate, each mill maintaining its own appropriate artificial climate the year around. Thus is obtained a uniformity of humidity and temperature impossible under even the best natural advantages, and conditions can be adjusted to any condition of manufacture. The installations are such that the most minute alterations of humidity and temperature automatically cause operation of controlling devices.

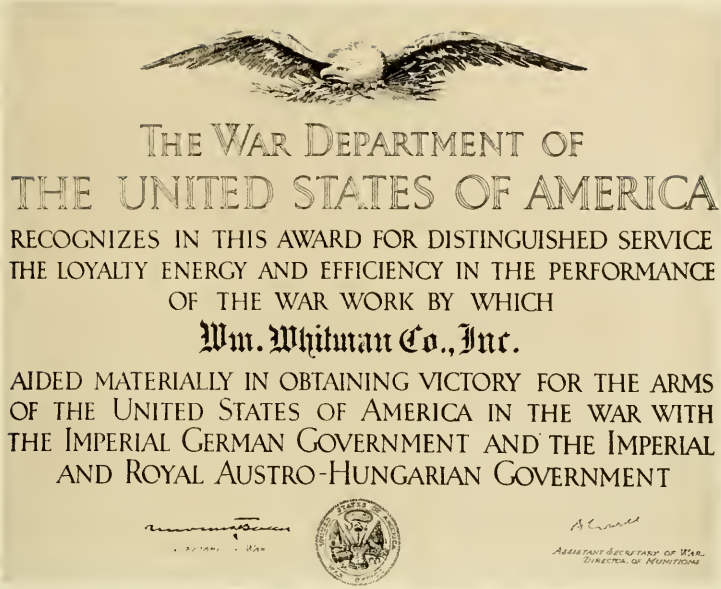
This phase of wool and cotton manufacture being supremely important, no single system of installation is depended on. Common to all the mills are, of course, the many standard installations of automatic humidifiers, drosophores, atomizers and similar apparatus; but in addition each mill has special installations and systems for its own particular purposes.

Thus the Acadia Mills in Lawrence guard against occasional dry summer periods in that region by surrounding themselves at such times with their own rain, having five tons of piping on the roofs for that purpose. While a bright, hot sun shines on Lawrence from a cloudless sky, the mills stand in a silver curtain of "Scotch Mist" the moment the natural climate falls below a certain prescribed condition.

The multiplication of installations by making perfect uniformity of conditions, insures constant uniformity of product. The chance visitor who does not know the intimate relationship of atmospheric conditions to wool and cotton, would probably assume extravagance when he sees such climate-making equipments as those in a single mill like the Arlington establishment. But actually this part of operation is so important that it justifies any expenditures that will produce results.

A description of the Arlington Mills atmosphere-governing system alone could easily fill a book as large as this volume, and it would be fascinating to the technician, for this one detail of the mill is a modern fairy story of science. A power plant ample to operate a

large industrial establishment is devoted to this single use. Such devices as drosophores are counted literally by the hundreds. The piping for atmospheric control and ventilation aggregates 28 miles. All the air that is admitted to the mills is filtered and washed, making for both hygiene and cleanliness of products. The ventilating system is of enormous power, for it is called upon to force into the establishment 3,600,000 cubic feet of air every hour. Hydrographic and thermographic recording instruments are duplicated in elaborate observation stations throughout the place. Dynamos, air pumps, cooling apparatus, live steam, blowers and suction pumps are parts of a bewildering system whose intricacies operate through more than 100 acres.



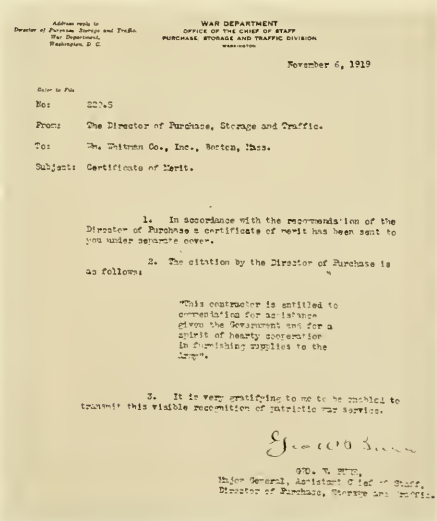
THE WAR DEPARTMENT OF
THE UNITED STATES OF AMERICA

RECOGNIZES IN THIS AWARD FOR DISTINGUISHED SERVICE THE LOYALTY ENERGY AND EFFICIENCY IN THE PERFORMANCE OF THE WAR WORK BY WHICH

Wm. Whitman Co., Inc.

AIDED MATERIALLY IN OBTAINING VICTORY FOR THE ARMS OF THE UNITED STATES OF AMERICA IN THE WAR WITH THE IMPERIAL GERMAN GOVERNMENT AND THE IMPERIAL AND ROYAL AUSTRO-HUNGARIAN GOVERNMENT

ASSISTANT SECRETARY OF WAR
DIRECTOR OF MUNITIONS



Address reply to
Director of Purchase, Storage and Traffic,
War Department,
Washington, D. C.

WAR DEPARTMENT
OFFICE OF THE CHIEF OF STAFF
PURCHASE, STORAGE AND TRAFFIC DIVISION
WASHINGTON

November 6, 1919

Refer to File

No: 220.5

From: The Director of Purchase, Storage and Traffic.

To: Wm. Whitman Co., Inc., Boston, Mass.

Subject: Certificate of Merit.

1. In accordance with the recommendation of the Director of Purchase a certificate of merit has been sent to you under separate cover.

2. The citation by the Director of Purchase is as follows:

"This contractor is entitled to commendation for assistance given the Government and for a spirit of hearty cooperation in furnishing supplies to the Army".

3. It is very gratifying to me to be enabled to transmit this visible recognition of patriotic war service.

GEO. W. [illegible],
Major General, Assistant Chief of Staff,
Director of Purchase, Storage and Traffic.

FOR DISTINGUISHED SERVICE

Arlington Mills

Lawrence, Mass.

ARLINGTON MILLS

LAWRENCE, MASS.

Capital Stock $12,000,000

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Treasurer: ALBERT H. CHAMBERLAIN ..... Lawrence, Mass.
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THE ARLINGTON MILLS

LAWRENCE, MASS.

The Arlington Mills produce within themselves every element in the manufacture of worsted fabrics. They buy, sort and grade their own raw wool, make their own wool top, spin every grade of worsted yarn, and weave, dye and finish cloth, delivering it ready for every use in which their woven fabrics may be required.

The Arlington Top Mill, in addition to making wool top for the Arlington spinning and weaving departments, cleanses, cards and combs raw wool on commission, handling the raw wool consignments as they are delivered by the owners, and returning the net product in wool top, with complete certificates of weight, conditioning, etc. Noil and other waste is saved and accompanies each shipment of tops.

WORSTED CLOTH, COTTON-WARP WORSTED FABRICS, STAPLE AND FANCY

PIECE-DYED, CROSS-DYED, YARN-DYED

In its manufacturing operations, this establishment, comprising the Arlington Mills in Lawrence, Mass., and a weaving and finishing branch in North Adams, utilizes 2,495,304 square feet, or 57.24 acres, of floor space. It is one of the largest single cloth-producing organizations in the world. Its product is finished ready for use as material for garments or other purposes. The principal manufactures are worsted fabrics for men's wear and women's wear. These general titles cover every kind of such material used for clothing.

The mills are recognized for their Staples, such as serges, cheviots, shepherd's checks, etc., which are of uniform construction year after year. They are equipped also to make Fancies and Novelties which vary according to fashion.

Arlington fabrics comprise Piece-dyed Fabrics woven from yarn in the gray or natural state, either wholly worsted, or worsted with plain or mercerized cotton yarn, or worsted with silk or wool yarn, dyed in the piece; Cross-dyed Fabrics woven from wool or worsted yarn in the gray with cotton yarn dyed black or fancy color, the fabric being dyed by a process that colors only the wool; Yarn-dyed Fabrics woven from dyed yarns all worsted or worsted and cotton.

Arlington Mills from the rear

Administration Building of the Arlington Mills, 1920

Main Corner of Arlington Mills Power House. This chimney is the largest in New England
It is 300 feet high and the inside diameter of its base is 23 feet $6\frac{1}{4}$ inches

The fabrics range in weights from 3 to 16 and more ounces to the yard, and in widths from 35 to 58 inches. In their construction are utilized all the varieties of combing wools grown in the world—Australian Merino and Cross-breds, South American Merino and Cross-breds, Cape Merino, American Merino and Cross-breds, the lustrous wools of pure English blood, and such wool-like material as the mohair from the Angora goat and the alpaca from the South American animal of that name.

This raw material is sorted under rules which fix grades especially established for Arlington products. The character of the world's wool varies astonishingly with each season's clip—so much so that every year presents problems almost like those of a new business. Adherence to standard is, therefore of the utmost importance if a mill aims to supply its customers with products whose quality is uniform season after season.

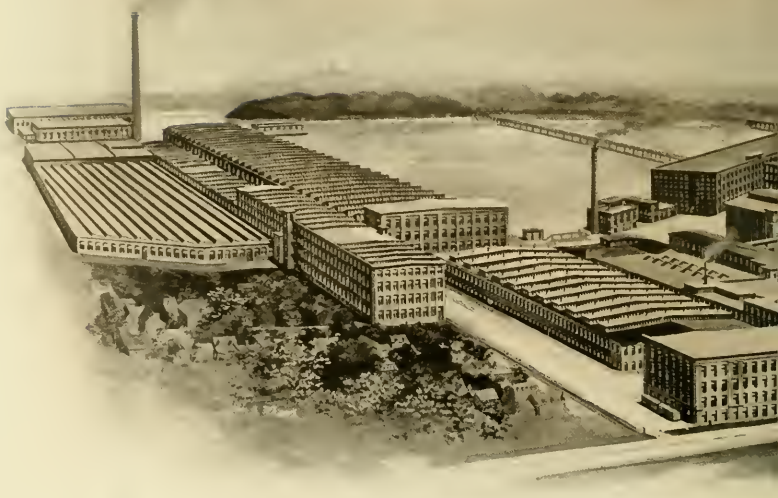
ARLINGTON MILLS WORSTED YARN SPINNING

Although at the time of their erection the yarn-spinning mills of the Arlington establishment were considered extraordinarily extensive for the possibilities of the general American market in yarns, the mills' own cloth business consumes all that can be spun despite continual enlargements. Indeed, new additional buildings had to be erected in 1919-1920 for the one purpose of meeting the demands of their own weave-rooms.

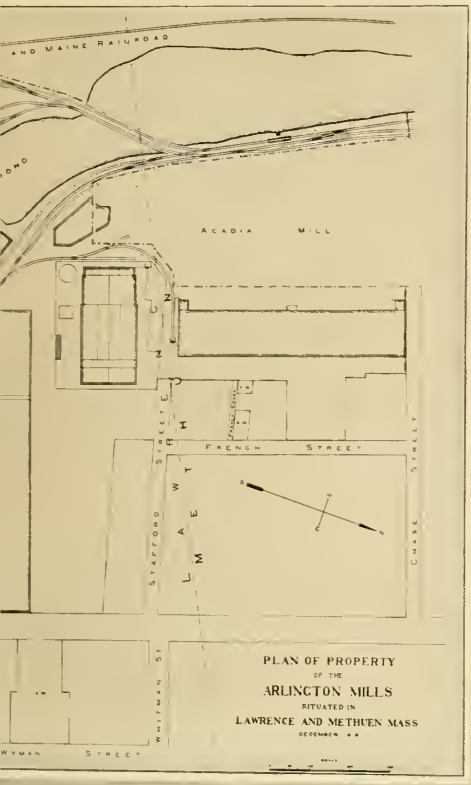
The size of the mills, and the number of spindles, twisters, warpers, looms, etc., make an array of figures that suggest the term "colossal"; but the character of the working organization in control of this equipment is such that Quality is the predominant feature of Arlington product. Good work and not quantity production is the task set for the workers. Quantity production is attained by ample facilities, labor-saving devices, system and a sufficiency of workers, so that neither men nor equipment are strained.

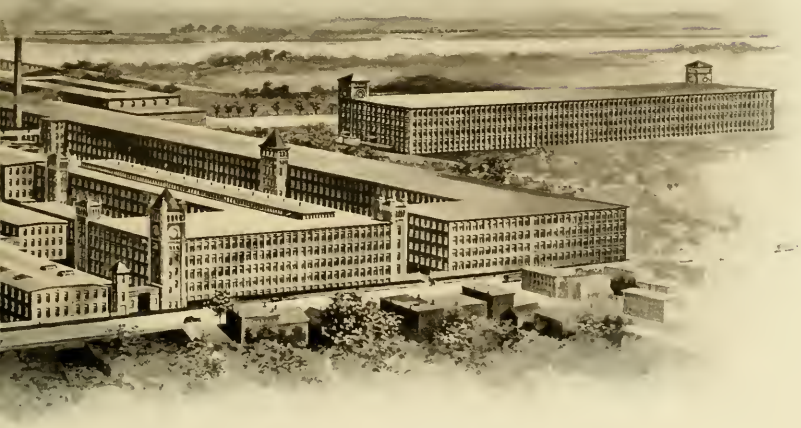
Arlington fabrics are profiting today from many past years of care in building up an intelligent and reliable working force. More than 75 per cent of the organization consists of people born in America or of English-speaking stock. The "floating" element is conspicuously absent.

The number of employees who wear service pins testifies to the permanence of employment, whose tenure may be indicated by the fact that some of the pins represent terms of service as long as twenty-five



Arlington Mills, Lawrence, Mass. This establishment cleanses its own ra
delivering them ready for use. It contains 26





ES THE WOOL TOP, SPINS ITS OWN YARN, AND WEAVES, DYES AND FINISHES FABRICS.
ITS FLOOR SPACE IS 2,409,125 SQUARE FEET (55.31 ACRES)

The First Arlington Mills, Lawrence, Mass., as they appeared in 1865

The Arlington Mills, from a photograph made in 1867

and more years. No pin can be earned by less than five years' continuous employment. The five-year pin of gold and blue enamel with a gold star is in steady demand as employees continually qualify for it. Direct personal interest is further maintained by participation for mill improvements through employees' committees whose suggestions and recommendations are viewed as a valuable part of the mills' co-operative system.

The principles of hygiene and comfort that govern the whole group of mills are expressed in the Arlington establishment by dressing rooms, rest rooms, hospitals, facilities for warm meals, bubbling fountains, individual steel lockers for each employee's belongings, abundant spaces between machines, circulation of washed fresh air, and encouragement of sports and amusements, extending to the formation of a mill band which gives a weekly concert in front of the mills during the lunch hour in summer.

The organization so fostered numbers almost 7000 people.

ARLINGTON WEAVES

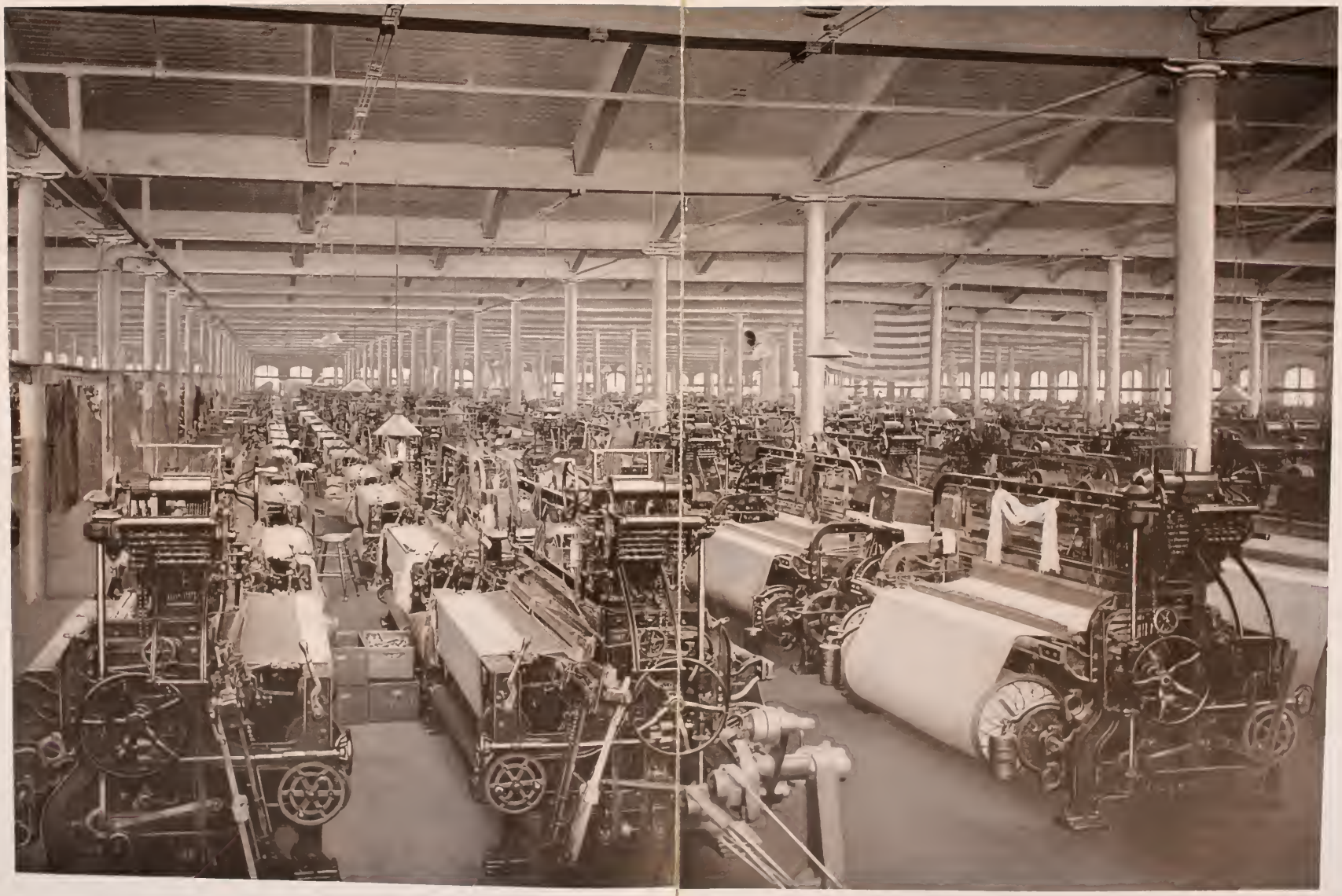
Good Weaving Begins in the Yarn-spinning Department

Although the yarn spun in the Arlington Mills is consumed entirely within the establishment, the testing and inspection departments inspect it as if it were to pass critical buyers, and in turn the weave-room management scrutinizes it as if it had been purchased outside.

Warping rooms, slashers and other equipments that prepare yarn for the looms are supplied with many devices for delivering a good warp, and their number and capacity is such that quantity delivery can be maintained without the haste which makes for passing inferior material.

The weaving, finishing and dyeing departments are provided with rooms of unusual area and with saw-tooth glass roofs and tall windows for maximum light. Each fabric is examined in the gray when it comes from the loom. As it passes through the many finishing and dyeing processes it is examined and re-examined. Thus every piece of cloth made in this establishment is seen by many eyes that study each inch of it: and when the product reaches the shipping department a final close examination is made of the piece, again from end to end.

The Arlington looms in number alone would make this weaving unit one of the very great industrial plants of the United States. But beyond this matter of capacity is the variety of the equipment, and the modernity of all the installations. They are of every kind useful



Arlington Mills Weave Room, No. 2

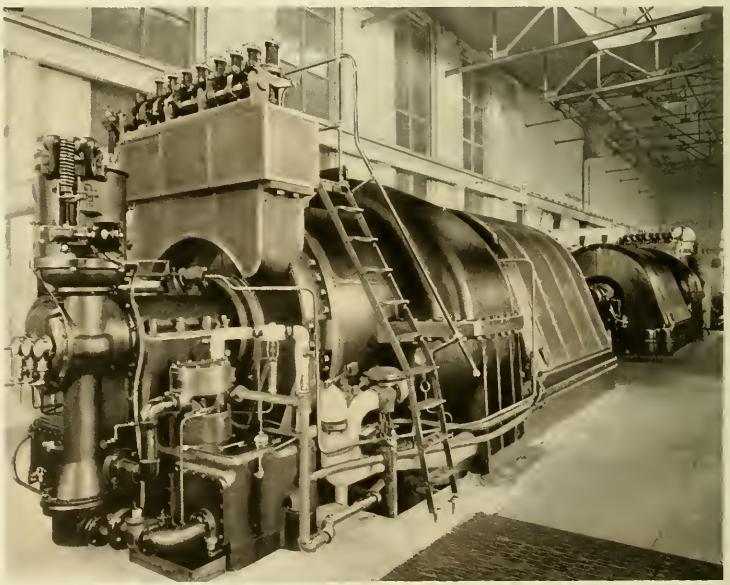
for any purpose in cloth-making, and represent all the widths serviceable for worsted and woolen cloth. Looms of maximum widths are so numerous that they alone exceed the number of all looms in many large American and European weaving mills.

Supplied with these facilities, and fed with material whose quality begins in the top mill, the weave-rooms are held to high performance. The definition of quality in the Arlington Mills is not variable or comparative. It calls for uniformity of quality not only throughout any given run of fabric or for one season, but for every fabric always.

FINISHING ARLINGTON FABRICS

In previous pages we have gone into an explanation of the methods of manufacture up to the gray cloth, showing the infinite watchfulness and care essential to the production of perfect fabric from the loom.

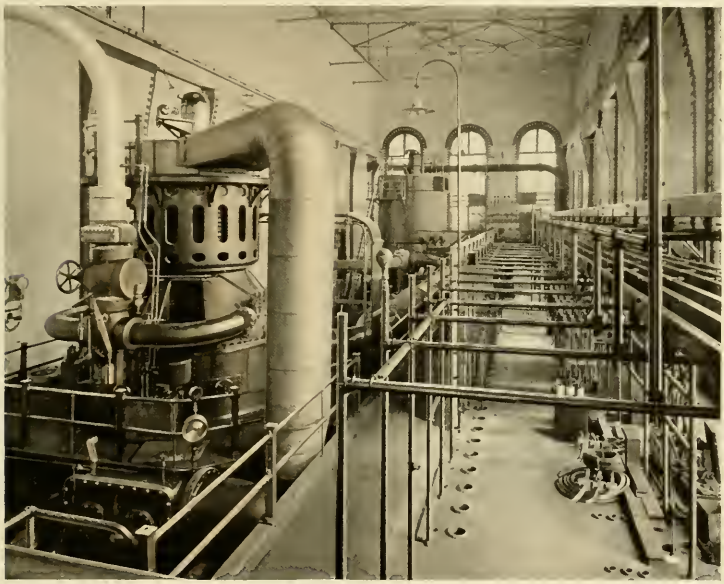
But at this stage the work of manufacturing the cloth is only partially done. The remaining processes of manufacture such as finishing and dyeing are of equal if not of greater importance. In fact, however



Arlington Mills. Part of Horizontal Turbine Room, showing two machines of 7500-kilowatts each

good a cloth may be when it comes from the loom, it can be easily spoiled in either of the subsequent processes.

In the worsted manufacture the vital part of production lies in these two processes. It is difficult to say that one is more important than the other. They go hand in hand, and are practically dependent upon each other. In the early days of the cloth manufacture the fulling was a separate trade by itself, but now in our American method of manufacture of worsteds it is combined with the other branches. Colors should be durable as well as beautiful and the aim of finishing is to develop the best possible fabric out of the material used. The finish must be adapted to the materials used and it must be suitable to the use to which it is subsequently to be put in the form of clothing. The processes through which a woven worsted fabric passes after it leaves the loom and before it is ready for use as a finished cloth, are so intricate that they bewilder everybody who visits even a small cloth-mill. A cloth under process of finishing is alternately twisted like rope, smoothed out, washed, dried and washed again, beaten, twisted, smoothed and twisted, etc., in a manner that seems confused.



Arlington Mills. Part of Vertical Turbine Room, showing a 5000-kilowatt and a 2000-kilowatt machine

Arlington Mills. View of Top Mill, showing part fronting on Broadway and North Side, Lawrence, Mass.

There is an important fact behind this. While the production of a piece of cloth really is according to steady plan, there are so many varieties of cloth and so many varieties of finish that no first-class results can be obtained by routine conduct of manufacture. The finest finishing installation that can be assembled is not good enough to produce uniformly good cloth. The machinery can do its work perfectly, but something greater is necessary. That greater thing is Knowledge and no machine has it.

Practically every piece of cloth has characteristics of its own. The quality of the season's wool clip, alterations in wool under spinning and weaving, effects of weather, all express themselves daily in a cloth-mill. Only knowledge and experience can meet such conditions. The Arlington motto, "Skill Wins Favor," means that an Arlington fabric is the result of human efficiency.

To describe all the steps in finishing a piece of cloth would require a large technical volume. The number of manipulations may be indicated by naming some: burling, washing, beaming, crabbing, scouring, fulling, carbonizing, steaming and stretching, gigging, napping, lustering, tentering, drying, shearing, dyeing, brushing, pumicing, polishing, pressing and decating.

The sequence of many operations varies according to the cloth and its purpose. Some cloths demand nearly all the processes. Others suffer from too many. Some profit from manipulations performed to the maximum. Others must be treated with extreme moderation.

For an example we may take fulling. The principle of fulling is as old as cloth-making. Equipments for it are largely standard, and are available to any cloth-mill. The process, however, has never been standardized and probably never will be, because fabrics made from wool are whimsical and never the same. For this reason the products of various cloth-mills with exactly similar fulling equipments may differ surprisingly. One will produce an excellent cloth and the other may produce a failure.

Is a cloth to emerge from the fulling mill in fine, "open" condition? Is it to be compact and "snappy"? The answer depends on the operators. One cloth will profit from generous scouring or soaping. One may gain from being scoured first, the very next piece may need a reversal of processes. Differences in treatment that may seem almost infinitesimal will make great differences in "handle" and appearance. Napping is not always required for raising a nap, but an expert workman will see that a given fabric can be improved by a gentle degree of napping or teazing.

Arlington Mills. Partial view of boiler house

These large and small refinements cannot be obtained by rote, and it is not possible to secure them from an uninterested working force, yet it is this aspect of a cloth-mill that determines the attractiveness of a cloth in the workrooms or show windows of the retailer. Beauty of color, for example, depends greatly on niceties of finish. Carelessness or poor technique in a single operation such as drying will produce striking unevenness and other defects in the best dye. Again, the finest finish may be destroyed by an unskilled dyeing department. The value obtained by the purchaser depends on the whole sum of efficiency in the mill.

The acknowledged success of Arlington dyeing is due very simply to the same principles that produce good Arlington wool top, yarns and weaves—good raw materials, modern methods for preparing dyes and for applying them, and careful work by a careful, experienced organization. There are, of course, particular Arlington appliances and processes, and quite unusual facilities such as the chemical laboratory which is believed to be one of the most complete that can be found in any similar industry. Its staff and resources

Arlington Mills. Pond and Water-cooling Apparatus in the Foreground. Power House at Right. North View of No. 2 Weave Room. The building in the rear contains the finishing departments of this cloth mill

A Flock of 3000 Sheep. The Arlington Mills uses the fleeces of more than 35,000 sheep in a single day's operation

cover every element from analysis of raw dye material to color tests of product in any state. The mills also are singularly fortunate in water supply, and further assure the purity of it by filter beds and continual tests that prevent any injurious ingredients from entering the dye vats. But behind this whole manufacturing system of the mill is that guiding force of science and practical Knowledge which extracts from the material facilities and resources the best virtues that they contain.

WOOL TOP

"Wool top" is the trade name for wool that has been brought to the point where it is ready to spin into yarn. It represents the first workable stage of wool after it has been sorted, degreased, washed, carded and combed.

"Top" is the net value that the owner gets out of his gross weight of raw wool. No matter how much his purchase weighs in the raw, or what he pays for it, the final result is determined by the value of the wool top.

Theoretically, any worsted mill can make its own wool top out of raw wool. But long experience of the economies to be gained by handling raw wool in large quantities and by specialized methods has led to general recognition of the advantage in making wool top production a separate business.

One of the Water Powers owned by the Arlington Mills. This illustration shows the dam at Millville, some distance above the Lawrence establishments

European wool-manufacturing districts practiced separate wool top production long before America's industry attained a powerful position. The Arlington Top Mill, in addition to introducing the principle in the United States, introduced a new method of cleansing wool—the naphtha solvent process. It eliminates the many large and small injuries done to wool by hot-water scouring with soap and obtains the maximum amount of serviceable wool.

The erection of the Top Mill was considered by the trade at the time to be a most hazardous experiment. Today, however, the mill is equipped to handle more than one and one-quarter million pounds of raw wool every week in regular order of business. Since its establishment, more than 500 million pounds of cleansed wool have been produced by it with profit to mill and customers. Its capacity is equal to one-fifth of the entire wool clip of the United States.

HANDLING WOOL ON COMMISSION

The Arlington Top Mill is so designed and operated that each shipment of raw wool to be cleansed and combed into wool top on commission, is handled by itself as it would be handled by the owner

in his own establishment. The consignment is taken straight from the freight cars to its own division on the storage floors and thence goes to a similar division in the sorting department, to be handled by a staff assigned to it alone and segregated from every other sorting force in the building. Rejected material goes directly into bags tagged for the owners. The selected wool drops into bins from which it goes to the degreasing plant, passing with similar integrity through the succeeding processes of washing, carding and combing. Under the combs are special bins into which drops the noil to be bagged, so that, when the last wool top has been packed the shipment is complete with everything that belongs to the original consignment of raw wool.

SORTING WOOL ON COMMISSION

Customers who send raw wool to the Arlington Top Mill are served by sorting and grading staffs who are experienced in doing this work accurately according to owners' instructions. Skilled "over-lookers" superintend the work specially on each consignment. The principle is the same as if the sorting were being done on a customer's own premises.

THE SOLVENT PROCESS FOR CLEANSING WOOL

Old methods for cleansing raw wool, many of which are still practiced extensively, are based on the simple principle of scouring the natural grease and other dirt out of it with hot water and soap. This method involves three factors which injures the fibre—over-heating, injuries from the chemicals in the soap, and matting or felting due to the necessary forcible manipulation in the soap bath.

Under-scouring and over-scouring are equally harmful. Insufficient cleansing that leaves the wool greasy makes so much trouble in the yarn and in the woven goods, that the tendency is toward

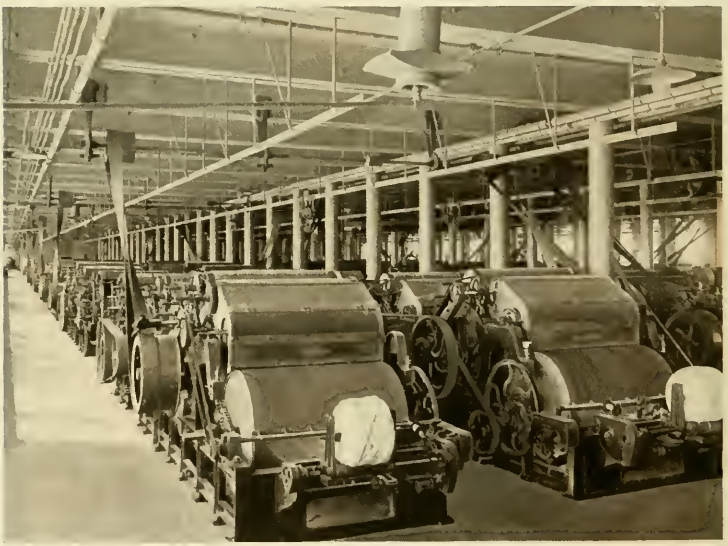
A Merino Ram

over-scouring, especially since the line between under-scouring and over-scouring is hard to draw. But over-scouring affects the wool fibre severely, and especially so if the temperature of the water is high, as it generally is.

It is very rare indeed that a scouring solution can be maintained at uniform temperature throughout. Uneven temperature makes uneven condition of wool. The difficulty caused by the soap problem may be understood from the fact that a 5 per cent solution of caustic soda with heat will destroy wool in 5 minutes. Most wool soaps contain some of this severe alkali.

Every sort of defect follows; from fibre that is harsh and stringy to fibre unduly soft with a greasy slipperiness. The wool cells are altered, with resultant losses of strength. The felting causes waste in the cards.

The naphtha process cleanses wool without scouring that does violence to fibre. Its action on the wool is limited wholly to separating it from the grease. No heat is used. The degreased wool emerges from the naphtha kiers and the driers odorless, and cleansing requires only the most gentle manipulation in tepid water in the washing machines. No soap is introduced for this washing, because the



Carding Room in the Top Mill of the Arlington Mills Group

naphtha process leaves in the wool sufficient potash which transforms itself into a natural bland soap in the washing vats.

The wool thus gained is sweet and clean and brilliantly white, representing a maximum amount of useful fibre. Because none of the staple is broken, tangled, matted or rendered stringy by mechanical manipulation, there is not only great reduction of the waste in carding, but Arlington cleansed wool produces top with a minimum of noil from the combs.

Thus, the naphtha solvent process as developed in the Arlington Mills mean: Better wool, and more of it.

The plant can pass the fleeces of more than 30,000 sheep through its degreasing kiers in a day, yet it controls its thousands of gallons of naphtha so perfectly that the most sensitive nose cannot scent a trace of odor.

ARLINGTON WOOL WASHING

In Arlington wool washing, everything is done to avoid manipulation of wool, because manipulation tends to mat or felt it and otherwise to affect working values. Hot water and soap scouring operations, far from loosening wool up, do the reverse, forming it into dense or stringy masses.

Wool-combing Room in the Top Mill of the Arlington Mills Group

The Great Kiers in the Wool Degreasing Plant of the Arlington Mills. The wool in its natural state is loaded into these tanks and cleansed by naphtha. The plant handles more than one million pounds of raw wool weekly

In the days of individual workers washing their own small lots of wool by hand, most of the cleansing was done gently in running streams, and this remains the ideal method today. To duplicate the condition on a great scale and conformably to the modern necessity for production, was the aim in planning the Arlington method of washing.

A series of long vats or "bowls" is so connected that water flows through them by gravity with an action like that of a natural stream. The raw wool is moved wholly by the current, being floated like foam. The natural suds that form from the potash left in the wool, act on it without violence and require no forcible scouring. Being untouched by hand or implement, it arrives at the end of the long stream in excellent open condition for the driers. As the water is tepid, never approaching any temperatures dangerous to wool, the washed wool escapes all the injuries caused by overheated and unevenly heated water, emerges without discolored or weakened fibres, and has not suffered the harmful shrinkages which are consequences of the use of heat.

Avoidance of all unnecessary manipulation is a feature of every succeeding process in making the tops. From the degreasing plant

to the wool top packing department the material is handled with a delicacy made possible by special equipment and purpose.

"CONDITIONING" WOOL

Wool has extraordinary facility for absorbing moisture. It may absorb from 5 to 35 per cent, and in any one day it may show widely varying gains or losses at different hours, according to changes in the humidity and temperature.

An absolutely reliable standard of condition that shall be fair to both buyer and seller is the only way to prevent losses on either side, or disputes in which both sides may quite honestly conflict. So important is this point that in Europe there have long been official institutions for certifying the condition of wool shipments.

Such official "conditioning houses" could not serve in the United States where the wool market is not concentrated in a few places as in Europe. Therefore, the Arlington Mills undertook early in its existence to seek exact facts for American use, and for a full year conducted careful tests which provided material for a series of charts that showed the weight-variation curves for all the hours of the year. The calculations made possible the establishment of a reliable and satisfactory standard for conditioning wool in the United States.

This Arlington standard calls for a fixed allowance of 15 per cent for regain on wool tops. It has proved so correct, and so fair equally to buyer and seller that it has been adopted by the trade in general as it gives all concerned a uniform basis for calculation, no matter what the humidity may be at any time of sale or shipment.

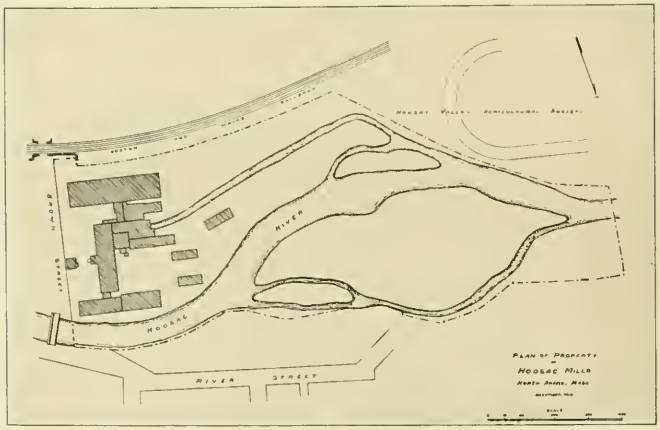
The allowance is determined by placing a given quantity of top in a receptacle where it is subjected to hot, perfectly dry air till it is absolutely "bone-dry." It is then weighed accurately on a fine scale, and to the bone-dry weight thus ascertained there is added 15 per cent for regain.

In other words, bone-dry weight with the 15 per cent added for regain, represents a fair average of wool in the United States. In actual use, of course, wool never can be bone-dry. It absorbs moisture so quickly that even when it is being removed from the drying receptacle to the scales it must be protected against the outer atmosphere.

The Arlington Mills conditioning rooms are fitted with devices to insure strict conditioning, and are under charge of men of long experience in this one work. European establishments of this character, such as the great conditioning house in Bradford, England, are

Exterior View of the Hoosac Department in North Adams, Mass. This Mill is operated as a part of the establishment of the Arlington Mills in Lawrence, Mass.

operated officially, and their certificates are legal evidence in law. The Arlington establishment is private; but it is gratifying to be able to say that the certificates which it issues with each shipment are accepted by the trade with the same confidence.



Plan of Property of Hoosac Mills

ARLINGTON MILL FABRICS

SERGES

All-wool Serges, Piece Dyed, Clear Finish
For Men's Wear and Women's Wear

All-wool Serges, Piece Dyed, Unfinished
For Men's Wear and Women's Wear

All-wool Cream Serges
For Men's Wear and Women's Wear

All-wool Mixture Serges, Wool Dyed, Clear Finish
For Men's Wear and Women's Wear

All-wool Mixture Serges, Wool Dyed, Unfinished
For Men's Wear and Women's Wear

All-wool Melange or Vigoreaux Serges, Clear Finish
For Men's Wear and Women's Wear

Worsted and Cotton Plaited Serges, Piece Dyed
For Men's Wear and Women's Wear

Cotton Warp Serges, Piece Dyed
For Men's Wear and Women's Wear

CHEVIOTS

All-wool Cheviots, Piece Dyed
For Men's Wear and Women's Wear

SUITINGS

All-wool Fancy Weave Serge Suitings, Clear Finish
For Men's Wear and Women's Wear

All-wool Fancy Weave Serge Suitings with Hairline Stripes
For Men's Wear and Women's Wear

All-wool Mixture Suitings, Wool Dyed
For Men's Wear and Women's Wear

All-wool Melange or Vigoreaux Suitings
For Men's Wear and Women's Wear

All-wool Plaids and Shepherd Checks, Yarn Dyed
For Men's Wear and Women's Wear

All-wool Panamas, Piece Dyed
For Women's Wear

ARLINGTON MILL FABRICS

SUITINGS

(Continued)

All-wool Tricotines, Piece Dyed
For Women's Wear

All-wool Poplins, Piece Dyed
For Women's Wear

All-wool Gabardines, Piece Dyed
For Women's Wear

All-wool Cheviot Suitings, Piece Dyed
For Men's Wear and Women's Wear

All-wool Tropical Suitings, Wool Dyed
For Men's Wear and Women's Wear

Cotton Warp Plaids and Checks, Yarn Dyed
For Women's Wear

Cotton Warp Serge Suitings with Hairline Stripes, Cross Dyed
For Women's Wear

RAINCLOTHS

All-wool, Gabardines, Wool Dyed
For Men's Wear and Women's Wear

Cotton-filled Gabardines, Cross Dyed
For Men's Wear and Women's Wear

Worsted and Cotton Twist Suitings, Piece Dyed
For Men's Wear and Women's Wear

Cotton Warp Cashmeres

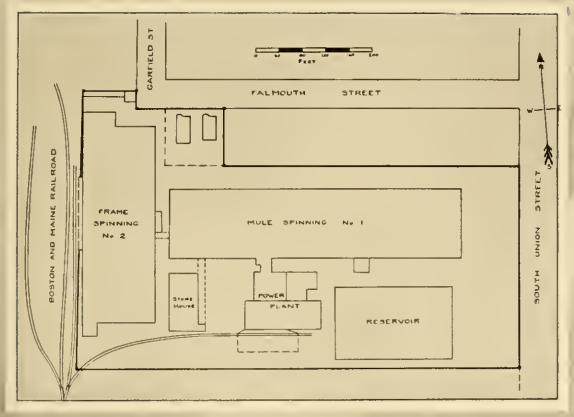
SPECIALTIES

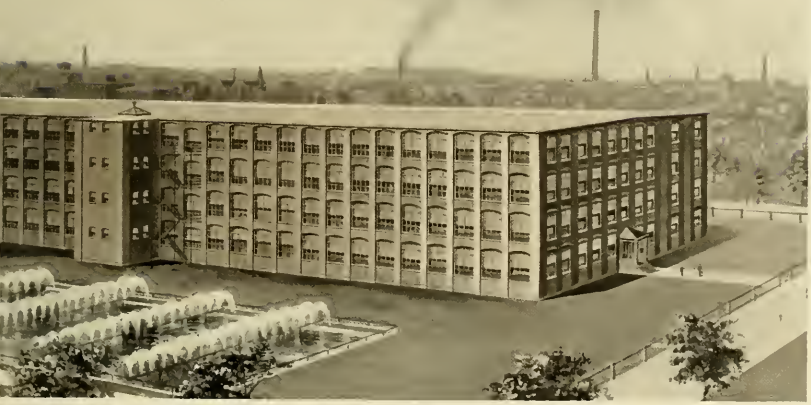
In volume large enough to warrant, specialties will be made

Monomac Spinning Company

Lawrence, Mass.

The Monom


GARFIELD ST
FEET
FALMOUTH STREET
BOSTON AND MAINE RAILROAD
FRAME SPINNING No 2
MULE SPINNING No 1
STONE SHOPS
POWER PLANT
RESERVOIR
SOUTH UNION STREET



COMPANY

MONOMAC SPINNING COMPANY

LAWRENCE, MASS.

Capital Stock.....$5,000,000

OFFICERS

President: WILLIAM WHITMAN.....Boston, Mass.

Treasurer: ERNEST N. HOOD.....Boston, Mass.

Clerk: FRANK C. CHAMBERLAIN.....Boston, Mass.

Agent: WALTER M. HASTINGS.....Lawrence, Mass.

DIRECTORS

ARTHUR T. BRADLEE.....Boston, Mass.

LOUIS H. FITCH.....Boston, Mass.

FRANKLIN W. HOBBS.....Boston, Mass.

ERNEST N. HOOD.....Boston, Mass.

MALCOLM D. WHITMAN.....New York, N. Y.

WILLIAM WHITMAN, JR.....Boston, Mass.

WILLIAM WHITMAN.....Boston, Mass.

SELLING AGENTS

WILLIAM WHITMAN COMPANY, INC. Offices: 78 Chauncy Street, Boston, Mass.; 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.

MONOMAC SPINNING COMPANY PRODUCTS

The Monomac Spinning Company is a worsted-yarn mill, producing single and ply-yarns both in all worsted and merino, in counts ranging from 10 to 60. These yarns are all drawn and spun on the French system. They are put up for the knitting trade on cops and cones, and for weaving on dresser spools or in skeins. Both worsted and merino yarns are made in various mixes as desired.

The mill has a reputation for single warp yarns and for single yarns for tops for rubber shoes where an extremely level yarn is required.

MONOMAC WORSTED YARNS

The Monomac Spinning Company selects and purchases its own raw wool, choosing and grading it according to the many particular kinds of worsted yarns made by the mill. As in the other mills of the group, hygiene, cleanliness and light are maintained for the equal benefit of workers and product, and the latest facilities for correct temperature and humidity assure unvarying conditions for the work in all stages of progress.

An organization has been built up with accurate knowledge of the production of French spun yarns, and the machinery for this purpose is the best existing in either America or Europe, having been made by the acknowledged leaders in French spinning equipment.

The installation of mule and ring-spinning frames and of finishing machineries is at least as ample as any in the western hemisphere. Its size was dictated by the principle of having an equipment that can always meet any demand for quantity without pressure on the time and care that are necessary at all times for uniform standard of quality.

MONOMAC MERINO YARNS

The yarn known by the trade-term "Merino" is, as is of course well known, a yarn spun of cotton and wool combined in many various proportions. If it is desired simply to produce a woolen-like yarn at a price far below wool, the cost of production can be reduced indefinitely by simply reducing the care in manufacture. But such a "merino" yarn is in effect only a wool yarn adulterated with cotton.

In true merino yarn manufacture, the principle is exactly the opposite. Cotton and worsted are combined not to adulterate the worsted or to produce a cheap imitation of wool yarn, but to create a standard product of quality with its own great value; among which is the

manufacture of underwear that will shrink less than if made from pure worsted.

A cheap "merino" yarn can be made cheaply by simply *mixing* cotton and wool. The best merino yarn is made from *blends* of cotton and wool that have been combed.

In the cheap *mixture*, cotton and wool fight. In spots, wool may dominate. In other spots, the cotton dominates. Such irregularities will run throughout every "merino" yarn improperly made. In the high quality *blend*, the wool and the cotton work together. The yarn throughout its length is a uniform product with the wool dominating,

Partial View of a French Mule Spinning Room in the Monomac Spinning Company's Mills

no matter what the proportions of wool and cotton may be. The process of manufacture is not different in general principle in either case. But the care and expenditure devoted to the details decide if the yarn is to be a true and useful merino.

In the Monomac system of manufacture. the merino character is obtained as the initial step, by the use of a beautiful long staple cotton grown in Peru. Peruvian cotton of *high rough* grade is more nearly like wool than any vegetable fibre now known to commerce. It is not smooth and "sleazy," but has a woolen feel and character to a marked degree. This is the kind of cotton used in Monomac

Partial View of a French Mule Spinning Room in the Monomac Spinning Company's Mills

"Merino Yarns." It passes through a number of processes including combing before being blended with worsted top on special mixing boxes by a particular method to make a blend that insures the maintenance through all subsequent operations of genuine merino.

Chief of these merino characteristics is that nowhere must the cotton "ride" on the outside of the yarn. The importance of this quality to the user is readily understood by remembering that wool is an animal fibre while cotton is a vegetable fibre. This difference causes marked and often fatal differences under treatment such as dyeing. In a poorly mixed merino yarn the cotton rides on the

The French System of Drawing Worsted Yarns. A Room in the Monomac Spinning Company's Mills, Lawrence, Mass.

outside. It is obvious that in a yarn made with imperfect mixing, when either the cotton or worsted is dyed, the result will be unsatisfactory. Monomac merino yarns may be dyed without showing weakness. Defects in a finished fabric naturally must be in exact proportion to the yarn. The weaver and knitter can estimate his damage only when it is too late.

The wool used in Monomac merino yarns is of the same source and character as the wool used for the all-worsted yarns. The cotton is purchased and graded by the Monomac Spinning Company.

The French System of Drawing Worsted Yarns. A Room in the Monomac Spinning Company's Mills, Lawrence, Mass.

MONOMAC SINGLE WARP YARNS

One of the Monomac specialties is production of the extremely and uniformly level thread required for single warp yarns and for the single yarns used for the tops of rubber shoes.

The degree to which *uniformity* of production has been brought in all the mills of the group, is a large factor in meeting all such special demands. Quality only in "high spots" is of little value to the user of a worsted or merino yarn. He may be lucky enough to get a chance shipment of high quality but if the next shipment varies, or if there are various qualities in one shipment, his net result will not be much above what he can get from the poorest quality in the lot.

In the weaving or knitting-room, the price to be obtained for quality in the finished product, and the economies to be gained by swift, efficient manufacture, are positively founded on continual, dependable evenness of the yarn. For this reason the Monomac Spinning Company makes *Uniformity of Quality* one of its big rules of manufacture.

A user will find any given Monomac product the same in quality next year or the year after next as it is now. If it can be improved, it will be. It will not be permitted to deteriorate.

A Very Old Spinning Wheel of European Pattern used in America before the factory system displaced household hand work

MONOMAC SPINNING COMPANY

FRENCH SPUN WORSTED AND MERINO YARNS

Gray
WORSTED YARNS.....Natural and Silver Mixes
In counts 14 to 60

Gray
MERINO YARNS.....Natural and Silver Mixes
In counts 14 to 60

Made in the following percentages of Worsted and Rough Peruvian Cotton:

Worsted	50%	60%	70%	80%
Cotton	50%	40%	30%	20%

Single yarns on Cops, Cones and in Skeins.

Ply Yarns on Cones, Dresser Spools and in Skeins.

For Hosiery, Underwear and Weaving.

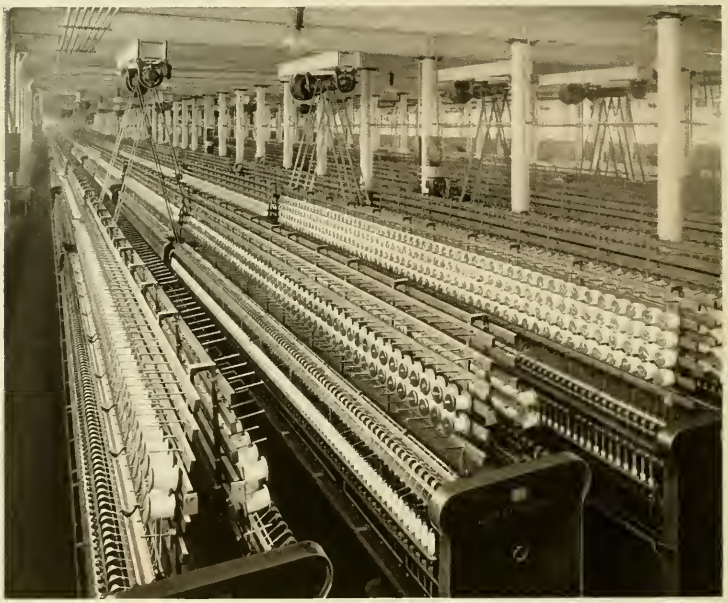
Cotton Yarns of Whitman Group of Mills

COTTON YARNS OF THE WHITMAN GROUP OF MILLS

An undeviating standard and method of selection of the raw cotton is in force uniformly for all the mills. It stands as an uncompromising sentinel at the door of each. Not a single pound of cotton can pass into the manufacturing departments if it fails to meet the laws laid down as to grade, length of staple, cleanness, uniformity, color and strength.

Rejected cotton cannot enter any mill on any pretext, even for use in the lowest priced mill product. It goes back to the shippers. All cotton is bought from them with this understanding, and as the mills pay a premium for the privilege, the cotton examiners are at full liberty to be exacting to the last degree.

Similarly, after cotton does enter a mill, only its best is used. The only cotton permitted to enter the yarn-spinning process is the cotton that has successfully passed the cards and the combs. Not an ounce of the tons that fall away under carding and combing ever enters into any mill product. No matter how fair in appearance or pleasing in quality, it is sent back as waste, and is so disposed of.



PART OF TWISTING ROOM, NONQUITT SPINNING COMPANY MILLS

To reject all cotton remorselessly that is not absolutely up to the standard means an amount of daily waste that may seem extravagant. But while it is costly to throw cotton away as waste, it is more costly to put it through the mill processes with the inevitable injury to the mill's good reputation.

To economize on waste is an economy that does not exist in the Whitman group of mills. Large as its percentage is, experience has demonstrated beyond all manner of doubt that unsparing rejection of cotton saves money to both mill and customer every year.

Cotton is examined and selected in a place specially constructed for the purpose. Automatic humidifying appliances keep the temperature and humidity at a constant point. Walls tinted a neutral gray, and great windows provided with a system of adjustable shades, assure an unvarying condition of light for examining and comparing tints. United States Government samples of the various grades of cotton are at hand under glass to maintain them unaltered as standards, and in addition the examiners have before them full size photographs of these standards. As in all other parts of the mills, scrupulous cleanliness is the rule.

Rejected cotton is removed at once to the waste rooms where it is graded and baled to be sold as waste. Accepted cotton is labelled and otherwise marked beyond all possibility of losing its identity in any of the succeeding mill processes.

USES OF COTTON YARNS

To apply the word "innumerable" to the uses to which cotton yarn is put, is an exaggeration, but only a slight one. There is hardly a modern activity that does not require something made from it.

An attempt to set down even a limited list of its more prominent uses would result only in recording practically everything with which mankind is concerned— transportation, agriculture, the household, electricity, mining, the fisheries, clothing, book publishing, chemistry. As said in an address by William Whitman:

"Cotton is the cheapest as well as the most useful fibre known. Cotton manufactures form the cheapest, most useful, most indispensable and most extensive part of the clothing of the great human family. Mingled and intermingled with almost all other fibres, and in all forms, cotton clothing is worn by mankind. Its use is not confined to any country or climate. Actually and figuratively, cotton lies nearer the human heart than any other substance for clothing which the art of man has produced. We walk in it by day and

we sleep in it by night. With the exception of food, it is difficult to conceive what could have a greater value. Nor are the uses of cotton manufactures confined to clothing. The versatility of cotton, so to speak, is marvelous.

"The limits of an ordinary address preclude me from attempting to enumerate the various uses to which it is put, and I will content myself with speaking of only one of the very interesting uses that recently came under my observation.

"In crossing the Island of Porto Rico from San Juan to Ponce, I saw hundreds of tobacco plantations in the valley and on the sides of the hills completely covered with cotton cloth. Some of these covered more than 100 acres, and you may imagine the beautiful contrast these plantations covered with white cloth made with the verdure of the hills as a background."

COTTON YARNS FOR KNITTING

Although spinning and knitting are older than recorded human history, new technical questions arise almost daily. In this as in all modern industry, the great fact is that while scientific advance continually lessens the demand on human physical exertion and labor, it increases in rapid ratio the demand on human foresight, carefulness and intelligence. In that aspect, by the way, there seems to us to lie the true civilizing meaning of machinery—not to save mere dollars by eliminating human labor, but to liberate men from all unnecessary manual drudgery and make them truly free to use their finer mental powers for the real work of mankind, which is to produce the best work possible in every field.

In our mills, machinery is so utilized. New labor-saving devices are being added continually, and all machinery is so placed and operated as to give the fullest freedom to the human worker's attentiveness. Thus, in the production of knitting yarns, there is concentration by the whole working force on the task of eliminating in every step of

A Skein of Cotton Yarn. Among other things, the Nonquitt Spinning Company Mills lead in American production of high-grade combed cotton yarns for mercerizing

manufacture those things which make for waste, seconds, broken needles, etc.—all those defects which, if they slip through, cause interrupted production to the customer and the subtle deterioration that creeps into an establishment when the workers have to fight annoying and harassing daily troubles that should not occur.

The Manomet, Nonquitt and Acadia establishments work for all those details that shall assure a yarn as free as yarn can be made from knots, slubs and other imperfections that are the bane of knitters.

The troubles caused by imperfect knitting yarns often are so apparently trifling in detail that they defy inclusion in any system of cost-accounting. But these tiny troubles, occurring here and there throughout a whole establishment, day after day, mean a big sum total at the end of a year or of a contract.

It is our effort to deliver yarns that shall prevent such losses.

COTTON YARNS FOR WEAVING

Production plays so important a part in weaving, that defects in the yarn which check or slow down the work are serious and expensive. Looms that are stopped for broken ends in the warp are a dead loss for that length of time and in addition the pay of the workers is lost. Where the hands are paid by piece-work, they, too, lose money, thus laying a cost on both mills and operatives

Another loss due to broken ends is that they mean seconds or imperfections in the goods.

The goal of perfection toward which we should aspire would, naturally, be a point where a loom runs continuously, with no ends breaking and no other stoppage, giving its maximum product to manufacturer and operative.

In buying warp yarns, the general custom is to test them for their breaking strength. This, however, is not an infallible guide. A

Cotton Yarn on the Put-up known as a Cone

Cotton Yarn Put-up on Tubes

yarn may have high breaking strength and at the same time have very little elasticity or resiliency. In the process of weaving, such a yarn will snap and break oftener than a yarn of somewhat lower breaking strength with greater elasticity or resiliency.

It is the practice of the mills to study each grade of stock used by them with all these facts in mind, and to make the yarn for warp purposes in that particular way and with that particular twist which shall give it the best possible properties for actual use in the loom. In the warping and other processes the yarn in these mills is so manipulated and prepared that the weaver shall get from it the best quality in his product as well as the greatest possible yardage in production.

The fact that the mills of this group turn their own yarn into cotton fabric, cotton and silk mixtures, worsted and cotton mixtures and other forms of woven fabrics, gives the yarn-mills the continuous benefit of experience. It enables them to do more than to meet problems that arise among our customers. It has enabled them to anticipate many. The manufacture of weaving yarn, therefore, is managed throughout these mills by accurate knowledge of what the weaver needs in any field; and the yarn experts have the co-operation of the weaving experts in solving any new problem.

UNDERWEAR YARNS

In producing yarns for underwear, the mills, conforming to their principle of studying the user's requirements and problems, consider the yarn not simply as it is when ready for the put-ups, but how it will work up, and how the finished product will look and feel.

In this large branch of the cotton fabric industry, quality in the yarn is vital to the manufacturer, for the consumer's impression as to quality and worth depends largely on its appearance. The person who buys underwear wants it to look clear and feel soft to the hands. Specks or spots suggest discomfort, and such a suggestion will be enough to cause it, even though the specks be quite innocent. Therefore a single shipment of defective yarn may injure a laboriously built-up reputation.

The underwear yarns of the Whitman Company group of mills are combed to the maximum, and all succeeding processes are alike aimed toward assuring a knitted fabric that shall look and feel well, be smooth and clear, and to the sharpest scrutiny prove itself free from specks and with that luster which comes only from yarn evenly spun from choice cotton.

The handsomeness of a fabric has its inception on the cotton fields.

Cotton is a bloom, and it is not a greatly exaggerated comparison to say that like a rose it must be plucked at the moment of full fruition if it is to be perfect. It has not attained its value if picked unripe. If picked after its best moment, it has lost something of its richness of full "bloom." As wilting robs the rose of color, so weather tinges the cotton and otherwise injures it, and mill processes that aim to correct or cover up the faults are limping behind the original mistake of permitting such cotton to enter the mill at all.

HOSIERY YARNS

While the factors that make a good underwear yarn are largely the same for hosiery, a few words may be said about the value of quality in yarns used for the latter purpose.

It is a trade assumption that because hosiery is dyed, the yarn for it need not necessarily be so perfect in the finer points of appearance, etc., since the dye may be depended on to do much toward eliminating superficial and minor faults. While this is partially true, it must be remembered that dye is expensive, and that the expense is justified only by the beauty of the resultant product. It is, therefore, good business to try to get 100 per cent of value out of it.

The more nearly right a yarn is, the more fully will the elegance of the dye be apparent. Yarn that at a slightly higher first cost will most nearly approximate the effect of silk when worked up into dyed hosiery, is unquestionably the most profitable yarn to use for any product that is to be sold at any price higher than the lowest.

In this product, appearance generally does the selling. Clearly it is not good selling to discount expensive knitting and dyeing by applying them to the yarns not fully worthy of the expense.

COTTON YARNS FOR SILK-FILLING

Of all cotton yarns made, none requires more skill and knowledge of the particular business in which it is to be used, than does the cotton yarn made for filling silk goods. In this trade the user must estimate the value of the cotton yarn not by its cost as cotton yarn, but by the cost of his expensive silk yarns.

A 10 per cent imperfection in a cotton filling yarn costs the user not merely 10 per cent of the value of the cotton. It will cost him at least 10 per cent of the value of his silk and may, indeed, lay a far heavier penalty on his warp.

It is here "Where Quality Counts." The mere cost of the cotton yarn falls away absolutely when it is worked up in juxtaposition to the precious material.

The dearest cotton yarn in this trade is the cheap yarn.

Cotton yarn for silk-filling simply must not be made cheaply. It must be combed to a high wasteage. It must be spun as evenly as skill and care can provide. Full, round, lofty yarn is vital for a cotton-filled silk fabric.

A cotton filling yarn that fails sufficiently to approximate silk in appearance and quality, not only betrays itself in the silk fabric, but it measurably reduces the silk to its own inferior grade. The very richness of silk is its weakness when used with poor cotton yarn. The contrast reacts entirely on the silk, and generally does it so violently that the most inexperienced eye can see it even though it may not be able to "spot" the reason.

Silk cannot "pull up" a poor cotton filling yarn. Poor cotton can and does "pull down" the silk.

COTTON YARNS FOR WEBBING AND BRAIDING

The Whitman group of mills makes a specialty of cotton yarn for the manufacturing of webbing and braiding, and in this field, as in others, works on the principle that the best selling argument is a satisfied user who has obtained a good product from yarns that work up well and economically.

Webbing

In webbing, and especially in elastic webbing, an especially important point is loftiness of yarns so that it will cover up the rubber thread warp in the elastic webbing and make a fair, uniform texture in other kinds. To achieve this result, special yarns are made by us for this purpose, and they are produced both in soft twist and in the harder twist required for special work. The yarns are furnished either gassed or ungassed, in counts to suit the specific requirements of customers.

Braiding

To withstand the extreme abrasion of yarn incident to the braiding process, the most scientific construction is necessary. The Whitman group of mills have developed their methods to a point where this quality is fully reached in the special yarns made by them both in the gray and in mercerized. A special braid twist is produced, and the yarns can be furnished in any of the counts or grades shown in the classified list for knitting yarns.

Electrical Trade

For insulation and covering of wires in electrical work the very heaviest cotton yarns are used on cables and heavy wires and the counts run thence down to the very finest for the delicate work of winding and insulating the thinnest magnet wires. To meet the demand in this field efficiently, therefore, it is necessary to maintain a system and mill equipment which produces constantly all counts from as heavy as 4's to 100's.

Under our group plan we are able to deliver a full range of numbers.

Yarns for the electrical trade are usually put on tubes, but can be delivered in other forms if desired.

Quality of cotton used and evenness of spinning are important for effective work in this trade.

Sewing and Shoe Thread for Manufacturers

While avoidance of knots is a most important element in all yarn-making, it is absolutely essential in the production of such things as sewing and shoe thread, and it has been one of the successes of the Whitman group of mills to reduce the trouble to a diminishing point.

By their general system which guards against imperfections in all stages of yarn-making, and by special methods and machinery for handling such imperfections as do occur, these mills have reached the point where they are putting out the greatest lengths in the United States of these products without a knot.

TIRE FABRIC YARNS

Endurance and service obtained from automobile tires depend to a large extent on the character of the cotton fabric or the cotton cord on which the tire is built up. A close knowledge of the conditions

Cotton Yarn on Spool

Cotton Yarn Put-up in Ball Warp, Nonquitt Spinning Company

which cotton yarn must encounter when it is part of the tire, is a necessary element in making the right yarn.

Since the earliest use of the pneumatic tire for bicycle purposes the cotton mills of the group have specialized in this field, and have thus been singularly well equipped to meet the accentuating demand for quality that has developed under the intense competition between tire manufacturers.

In this trade, breaking strength has heretofore been practically the sole test for determination of quality. As in the weaving problem, but more emphatically so, this test is insufficient. The necessity is not only breaking strength, but resiliency and elasticity. The fabric in a tire must have more than the mere strength that resists tearing apart. It must be capable of bearing the bending or folding strains and resisting the abrasion that come on cloth used in tires.

Elimination of knots, bunches, etc., is considered one of the essentials in the mill brands of these yarns, and a system carefully maintained to that end has succeeded in diminishing them to a decidedly small point. Such imperfections as occur in cord tire yarn are cut out and spliced under careful method, thus assuring a tire yarn without knots.

Facility for turning out large quantities quickly is an important feature which will speak for itself to big users and dealers who are confronted so often by emergencies that demand immediate delivery of quantities far too great for ordinary mills to provide. The system under which these mills co-operate makes it possible to meet such situations.

Millions of dollars are being spent to advertise the various makes of automobile tires. The advertising is based on just one point—Quality. Manufacturers of tire fabric cannot afford to discount this selling value by taking chances with poor yarn.

The Whitman organization is in position to supply tire yarns in the single on beams and tubes for the manufacture of tire cloth, and twisted into plies suitable for the various cord tire requirements.

KNOTS

Broken threads are by no means the only or the chief cause of knots in cotton yarn. Countless big and little imperfections that occur during all stages of a spinning process not sharply controlled, all have to be cut out, and thus force knots on slovenly operators. Oil spots due to dirty or badly arranged machinery, unevenness due to poor spinning and to lack of continuous shop-tests, insufficient carding or combing, etc., all produce these defects which must be removed by the crude method of cutting out.

There is one way to avoid it, and that is to prevent imperfections. It can be done only by a mill-system that is organized for the purpose from "the ground up." Scrupulous cleanliness, properly arranged and tended machinery and a reliable working force are all essential to success.

Having reduced the necessity for knots to a minimum, it is necessary to have a uniform and rigidly enforced system for tying knots that cannot be avoided. This part of the operation of yarn-mills is a quite difficult one, for the workers who attend to it are confronted with the fact that the best form of knot is the hardest to tie.

The knot most easily and quickly tied is the spoolers' knot but this is usually the least desirable knot for almost any industry that works yarn up into fabric. No matter how well it is tied, it makes a "bunch" that lies at right angles to the yarn and, therefore, is least likely to slip smoothly through the eyes of needles. In the finer counts this fact often is almost negligible, but in coarser counts it is of great importance.

The Manomet Mills, the Nonquitt Spinning Company and the Acadia Mills long ago instituted a system of education in knot-tying,

Various Forms of Put-ups of Cotton Yarns. Spinning Bobbins and Cops

and a regular part of the established operating costs goes to supervision in this field and to teaching workers exactly what knots to tie and how to tie them.

No knots whatever are permitted in yarns made for uses where absence of knots is important. In all these, splicing has long been the only method. Wherever knots are allowed, the constant effort is to tie none but weavers' knots, because these are so made that the tied ends lie parallel to the course of the yarn when it is in use for knitting and weaving.

By means of special machinery, such threads as shoe threads in heavy plies and other similarly heavy yarns can be made in extraordinary lengths without any knots whatever. The same is true of tire yarns.

Some of the trouble caused by knots (such as breaking needles) is plain enough to the user. More of the trouble is insidious. Imperceptible in detail, in its sum it makes a bad "drag" on a fabric-producing plant. To eliminate imperfections, and hence knots, is one of the chief characteristics of this group of mills. It is one of the advantages obtained by the consumer who buys Whitman quality.

MULE-SPUN COTTON YARNS

Because mule-spinning is more expensive than frame-spinning, it is not a tempting branch of cotton yarn production to yarn-makers who base their operation on low cost of manufacture pure and simple. As a matter of fact, extensive mule-spinning can be afforded only by mills whose reputation for high-grade products gives them a safe position.

It is a matter of years and of expensive effort to gain a reputation that shall guarantee enough steady business to support a mule-spinning equipment of any magnitude. For this reason an astonishingly small number of mills in America are able today to furnish mule-spun cotton knitting yarns of high grade in any notable quantity or in quick order.

The Manomet Mills have been able to so develop this important form of yarn manufacture that they have the largest output of mule-spun cotton yarns for sale in the United States.

The scope added by this large equipment for mule-spinning places them in position to fill the requirements of any maker of any grade of fabric. The excellent quality of the frame-spun yarns guarantees a maximum of the elasticity, softness and appearance needed in cotton textiles of any quality, while the mule-spun yarns add the final value which is wanted in highly priced material.

Manomet Mills

New Bedford, Mass.

MANOMET MILLS

New Bedford, Mass.

Capital Stock.....$8,000,000

OFFICERS

President: William Whitman.....Boston, Mass.

Treasurer: Arnold C. Gardner.....New Bedford, Mass.

Agent: Jesse A. Knight.....New Bedford, Mass.

Clerk: J. Earle Parker.....Boston, Mass.

DIRECTORS

Henry W. Bliss.....Boston, Mass.

Arthur T. Bradlee.....Boston, Mass.

Arnold C. Gardner.....New Bedford, Mass.

Franklin W. Hobbs.....Boston, Mass.

George E. Kunhardt.....Lawrence, Mass.

Josiah M. Lasell.....Whitinsville, Mass.

Charles W. Leonard.....Boston, Mass.

E. Kent Swift.....Whitinsville, Mass.

William Whitman.....Boston, Mass.

SELLING AGENTS

William Whitman Company, Inc. Offices: 78 Chauncy Street, Boston, Mass.; 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.

Picker Room, Manomet Mills, New Bedford

MANOMET MILLS

NEW BEDFORD, MASS.

The Manomet Mills manufacture Combed Cotton Yarns in the heavier and medium counts—that is, from number 4 to number 30—in the single and in the ply.

In these combed yarns, which they are able to offer either mule-spun or frame-spun as may be desired, they make a specialty of yarns: For the better class of knitted goods, both hosiery and underwear; for the webbing, thread and embroidery trades; and for every class of heavy count woven products, including specialties for silk goods weavers.

The mills use and are able to offer these yarns made from American, Egyptian and Sakellarides Egyptian cotton.

They are in a position to supply all the yarns gassed if desired.

Manomet Mill
No. 3

Manomet Mills
Nos. 1 and 2

Manomet Mills
No. 4

Manomet Mills, New Bedford, Mass. The largest single cotton-yarn producing plant in the world. Its reputation for equipment, method and size has drawn visiting experts from all the cotton-manufacturing nations

Nonquitt Spinning Company

New Bedford, Mass.

NONQUITT SPINNING COMPANY

New Bedford, Mass.

Capital Stock.....$4,800,000

OFFICERS

President: William Whitman.....Boston, Mass.
Treasurer: Leonard C. Lapham.....New Bedford, Mass.
Agent: Fred L. Heyes.....New Bedford, Mass.
Clerk: J. Earle Parker.....Boston. Mass.

DIRECTORS

Henry W. Bliss.....Boston, Mass.
Arthur T. Bradlee.....Boston, Mass.
George E. Kunhardt.....Lawrence, Mass.
Leonard C. Lapham.....New Bedford, Mass.
Josiah M. Lasell.....Whitinsville, Mass.
Charles W. Leonard.....Boston, Mass.
E. Kent Swift.....Whitinsville, Mass.
William Whitman, Jr.....Boston, Mass.
William Whitman.....Boston, Mass.

SELLING AGENTS

William Whitman Company, Inc. Offices: 78 Chauncy Street, Boston, Mass.: 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.

NONQUITT SPINNING COMPANY

NEW BEDFORD, MASS.

The Nonquitt Spinning Company manufactures Combed Cotton Yarns in the finer counts—that is, beginning at number 30 and running as fine as number 100—both in the single and in the ply.

The yarns of this mill are frame-spun. The machinery is especially arranged to produce a grade of yarn higher than the ordinary yarns on the market, meeting the needs of manufacturers of the better grades of light underwear and hosiery, silks, plushes and woven goods of all characters, where quality of material and manufacture are the essentials of good product. In other words, the yarns of this mill supply those trades, both in knitting and weaving, to which superior yarns are necessities.

All the Nonquitt Spinning Company yarns can be supplied gassed if desired.

The Nonquitt Spinning Company

An Emergency Room in the Manomet Mills. Typical of all emergency rooms in the William Whitman group of mills

Acadia Mills

Lawrence, Mass.

View of Acadia Mills

ACADIA MILLS

LAWRENCE, MASS.

Capital Stock.....$3,000,000

OFFICERS

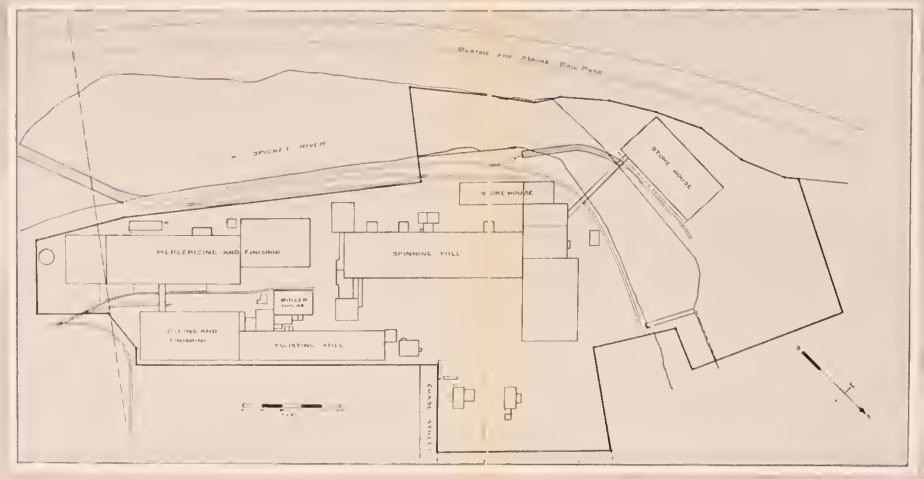
President: WILLIAM WHITMAN.....Boston, Mass.
Treasurer: ERNEST N. HOOD.....Boston, Mass.
Agent: WILLIAM A. PEDLER.....Lawrence, Mass.
Clerk: F. C. CHAMBERLAIN.....Boston, Mass.

DIRECTORS

ARTHUR T. BRADLEE.....Boston, Mass.
FRANKLIN W. HOBBS.....Boston, Mass.
ERNEST N. HOOD.....Boston, Mass.
CHARLES W. LEONARD.....Boston, Mass.
MALCOLM D. WHITMAN.....New York, N. Y.
WILLIAM WHITMAN, JR.....Boston, Mass.
WILLIAM WHITMAN.....Boston, Mass.

SELLING AGENTS

WILLIAM WHITMAN COMPANY, INC. Offices: 73 Chauncy Street, Boston, Mass.; 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.



ACADIA MILLS, LAWRENCE, MASS. THIS ESTABLISHMENT SPINS A LARGE QUANTITY OF COMBED COTTON YARN OF HIGH QUALITY, BUT ITS SPECIAL ACTIVITY IS "PROCESSING." IT MERCERIZES, BLEACHES, DYES AND GASSES YARNS FOR ALL PURPOSES TO WHICH HANDSOME COTTON YARN CAN BE PUT. ITS POSITION AS THE FOREMOST MERCERIZING PLANT ON THIS CONTINENT IS ADMITTED

Warp Balling in the Acadia Mills. These mills have especially large and perfected installations for this purpose

ACADIA MILLS

LAWRENCE, MASS.

The Acadia Mills manufacture Combed Cotton Yarns in all counts from number 3 to number 100.

The entire product of these mills consists of Processed Yarn—that is, yarn carried beyond its natural condition through the processes of mercerizing, bleaching or dyeing. The yarns can be supplied both gassed and ungassed.

While making a specialty of these yarns for the knitting and embroidering trades, they are in position also to supply them wherever demanded by the weaving trade, and put the yarn up in forms suitable for any demand of such trade.

PROCESSED COTTON YARNS

Processed Cotton Yarn is yarn that, after it comes from the spinning mill in the natural color known as "in the gray," has been subjected to mercerizing, bleaching or dyeing. It may be put through only one of these processes, or all, or any in combination. Gassing is also done in connection with processing.

The Acadia Mills, built for processing, have developed all the processes so uniformly that each individual process profits from experience with the rest. The mercerizing establishment must give the dyeing establishment of the mills perfect satisfaction, and as a result the outside converter who buys undyed mercerized Acadia yarns is assured of a product that will develop evenness and beauty in his dyeing vats.

The gray yarns processed by the Acadia Mills are spun by them or are products of the Whitman Company group, made under the same rules of manufacture. They are all of special quality for mercerizing, and thus all the Acadia processed yarns, even if unmercerized, have higher quality than ordinary yarn.

The twist used by the Acadia Mills is a particular twist adopted after long experiment for gaining the maximum of luster and brilliancy.

The importance of eliminating knots, slubs, and other imperfections from these yarns which are used in the more expensive manufactures, has led to an exceptional development of machinery and organization for this one purpose alone. In addition to numerous automatic devices for catching even tiny flaws, a large force of workers is maintained solely for watchfulness and examination. Besides reducing

the breakage of needles, these refinements enable the user to produce uniformly good product, free from seconds.

After a yarn has passed the watchers who supervise the processes, a re-examination is made of the yarn in the warp, and again as it goes on bobbins and cones. When finally assembled for shipment, each put-up is taken up separately and scrutinized in the ultimate examining rooms.

Such few knots in ply yarns as cannot be avoided are always weavers' knots even in knitting yarns, and Acadia knitting yarns have long been distinguished for their uninterruptedly smooth maximum lengths.

Elasticity in Acadia mercerized thread yarn, due to the Acadia twist, gives it unusually favorable running qualities. It is said to represent a silk twist more nearly than any thread yarn on the market, and it is of maximum strength.

The mercerizers, both for skein and warp mercerizing, and all the finishing machinery, are of the latest construction and fitted in all possible ways with special appliances to maintain the standard of Acadia quality.

MERCERIZING

The industrial art of mercerizing cotton yarn has special significance in relation to the William Whitman Company, because its President and others bore the brunt of the early fight for universal American enjoyment of the process, when its use involved a long and costly legal battle. After the legal victory was won, there ensued many labors to perfect the technical methods; and in these, again, the organization did work that it is satisfactory to recall.

When the process had been made available to all, it happened most unfortunately that short-sighted men, not realizing the true values of mercerizing, mis-used it to give inferior cottons a spurious selling quality. As is well known now, mercerizing develops its full richness and its other beneficial qualities only when it is applied to cotton yarns spun from carefully selected and prepared high-grade, long staple cotton. Applied to cheap cotton, the luster is inferior. This early bad practice brought disrepute on a process which, in fact, is one of the very valuable contributions to human service.

The William Whitman Company organizations from the beginning worked stubbornly to develop the true importance of mercerizing, which is not only in producing a beautiful silk-luster, but also in decidedly improving cotton in roundness and strength, in working qualities and in adaptability to fine dyeing.

Acadia Mills Warp and Gassing Room. An unusual number of gassing outfits is used in these processing mills, and many various and ingenious methods of gassing are employed. Entire warps are gassed at one operation, and the mills have developed particular styles of gassing machines

Today the mills in this organization are the largest producers in the world of Mercerized Cotton Yarns and of Gray Cotton Yarns for Mercerizing.

MERCERIZED COTTON YARNS

The intimate relation of the organization to mercerizing since its inception in America, naturally suggests particular efficiency in the Acadia Mills which were constructed specifically for mercerizing and otherwise processing cotton yarns.

In principle, the process of mercerizing is so simple that it can be described in twelve words: "Subjecting tightly stretched cotton yarn or fabric to a caustic soda bath." In practice there are many details and refinements, and some of these demand the most delicate perception if the yarn is to emerge successfully treated. Variations in the yarns, variations in the materials of which the yarns are made, variations of twist in their manufacture, together with the varying natures of the chemicals used and the varying temperatures of air and water when they are used, combine to create a menace whose omen is permanent over a mercerizing mill; the menace of unevenness. This unevenness, which is a continual danger-point in the

Acadia Mills Quilling Machinery

process, may be so distributed over the yarn that it does not at all make itself noticed to the buyer. But when the user attempts to work such yarn up, the many variations (not only in luster but in form) announce themselves sharply.

The dyer in particular suffers from unevenly mercerized yarn, for mercerizing gives cotton yarn such an affinity for dye that the best mercerized parts take on much deeper shades than the rest, thus causing mottled dyeing, or color that seems to run in streaks, etc. It may vary in degree, but it is bound to occur with any yarn that has not been treated with absolute uniformity.

In apparatus and in human organization, the Acadia Mills have all resources for getting uniform results. Of the mechanical equipments some are unique, and practically all have refinements. Among the workers, both in the spinning and processing departments, are many who have been with the mills since they were built. The entire force is one of unusual character and skill.

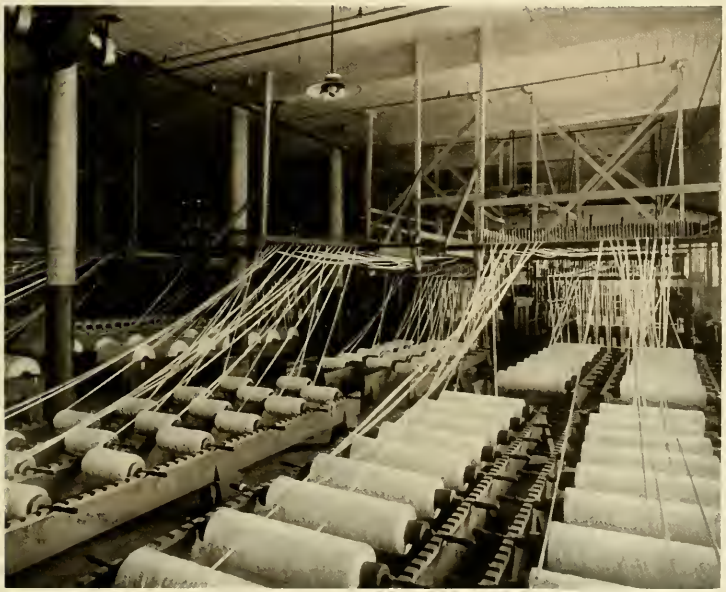
Besides the mills' own chemical laboratories and testing rooms, they have full benefit of the chemical laboratory of the Arlington Mills which is one of the best equipped for this purpose in the United States.

In point of magnitude the Acadia Mills is the largest mercerized yarn producing establishment in the western hemisphere.

BLEACHED COTTON YARNS

The mere process of bleaching is common and simple. There are no secrets in it. But there are few industries whose results vary so much. The chief factors in this are the varying degrees of care and knowledge in the bleacheries.

Water plays an important part. This most common liquid has absolutely no uniformity. Every source produces a different kind. A water that to the naked eye or even to ordinary tests presents itself as perfectly pure, will be shown under exhaustive chemical tests to contain ingredients, often numerous, that make it harmful for a delicate process like bleaching. Even a given supply of water from a single source will vary from day to day, according to various conditions. An apparently bright, clear water may still hold in invisible solution enough earthy matter to make a decided shade in the bleached product.



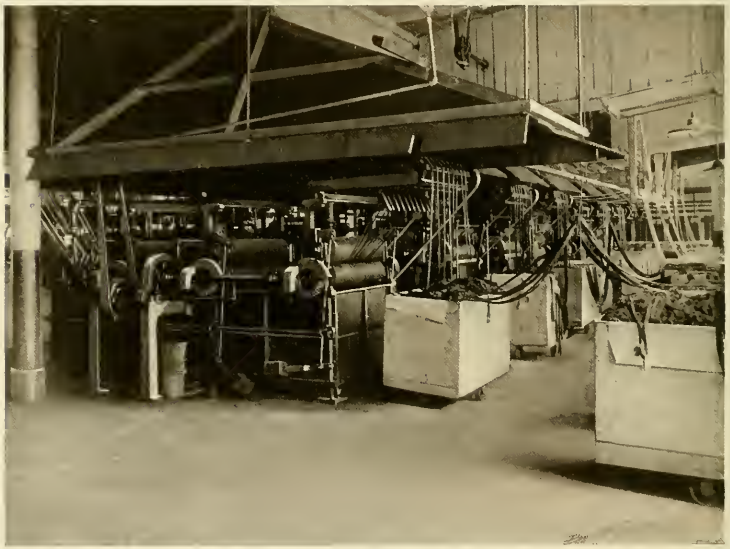
A View of One of the Rooms in which Warp Mercerizing is Done

The Acadia Mills have elaborate installations to protect this primary element of the bleaching process. The water that enters the establishment has to pass through a series of filtration beds, and to make assurance doubly sure there is a double filtration, two methods being in use.

A laboratory system is devoted entirely to testing this filtered water, to the end that throughout the working day it shall be impossible for any to pass into the processes unless it is chemically pure for its purpose. Special color tests are used to make sure that it is completely de-colorized. This is a fundamental part of the work of achieving a pure white finish on the bleach.

Similar care is expended on all other liquids, etc., that are factors in the process. "Rule of thumb" methods for ascertaining their quality do not exist in any departments. The chemist and his laboratory methods govern all.

Product is watched in the same manner during its entire passage through the bleach. Color-testing appliances of the latest types show up every possible modification of white and thus enable the mills to catch even the slightest shade of variance from the mill



Special Attention is Paid to Dyeing in the Acadia Mills. A Glimpse of a Dye House

standards which serve for comparison in every test. Temperatures, time, methods of drying, etc., are all controlled by equally scientific methods.

DYED COTTON YARNS

Maintenance of perfect equality of shade is of immense importance to users of dyed yarns. It is not enough that any one shipment shall run uniform throughout. The manufacturer of any product made from dyed yarns must have the assurance that he can depend on the same shade whenever he wants it, year after year if necessary.

The Acadia Mills are organized with particular care for this service, and have every facility for achieving uniformity, from the handling of the dye to the final examination of the dyed yarn in the put-up.

Every result in this mill must match up with the mill standards which are absolute perfect specimens of dyed yarns preserved under lock and key in light and dust-proof cabinets. The color experts make their comparative examinations in specially equipped rooms under vapor color-matching lamps which throw the most trifling variations of shade into vivid and startling contrast.

The necessity for such a circumstantial and rigorous daily system will be understood when it is remembered that various skeins of the same kind of cotton yarn, dyed in one vat, may all vary in shade if there has been the least difference in manipulation. One single skein may come out with varying shades.

These defects in dye may be due to any one of scores of the manipulations demanded in the process. It may be that inequality in taking dye is due to inequality in spinning. It may be due to various handlings of the yarn either before or after the actual dyeing. It may be caused by inequalities in the dye itself, to condition of the liquid, etc. Only a mill designed and equipped for uniformity can combat all these dangers successfully.

Good dyes, specialized knowledge and modern equipment are demanded, of course, and it is hardly necessary to say that the Acadia Mills possess these. It is the way good equipment is utilized that determines the quality of Acadia Dyed Cotton Yarns.

The Kind of Cotton Used in the Acadia Mills
No. 1, Raw Cotton; No. 2, Card Sliver

Acadia Mills Cotton
No. 3, Combed Skein; No. 4, Roving Skein

Acadia Mills Put-ups

No. 5, Spinning Bobbin; No. 6, Twisted Bobbin; No. 7, Quiller Bobbin; No. 8, Gassed and Mercerized Yarns on a Cone; No. 9, Gassed, Mercerized and Bleached Yarns on a Cone; No. 10, Gassed, Mercerized and Colored Yarns on a Cone.

GRADES AND CLASSIFIED LISTS

of

COTTON YARNS

made by

THE MANOMET MILLS

THE NONQUITT SPINNING COMPANY

THE ACADIA MILLS

PART 1. Description of Grades by Mill brands.

PART 2. Classified list showing Grades, Counts and Put-ups, for Knitting, Weaving, Webbing and Tire Trades.

DESCRIPTION OF GRADES

BB Grade: Made from Combed American Cotton. Mule-spun. In Nos. 4 to 30 in single and ply, put up on cops, cones, tubes and in skeins.

CC Grade: Made from Combed American Cotton (same grade as *BB*). Frame-spun. In Nos. 4 to 30 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

TE Grade: Made from Combed Egyptian Cotton. Frame-spun. In Nos. 4 to 30 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

SS Grade: Made from Combed Sakellarides Cotton. Frame-spun. In Nos. 4 to 30 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

PC Grade: Made from specially cleaned and selected Combed American Cotton for the manufacture of pirn cops, to be used in filling for the silk trade. Mule-spun. In Nos. 10 to 30 in single, on through cop tubes.

Any and all of these mills make special counts, plies, and put-ups on request whenever there is business sufficient to warrant it, and will quote special prices.

A Card Room in the Manomet Mills. All cards are driven from shafting placed under the floor, thus eliminating overhead drives, with their danger of dripping oil, dust, lint, etc.

MANOMET MILLS

FOR TIRE PURPOSES

CC Grade: Made from Combed American Cotton. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

DD Grade: Made from Combed American Cotton but longer staple than *CC*. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

TE Grade: Made from Combed Egyptian Cotton. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

PE Grade: Made from Combed Peruvian Egyptian Cotton. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

SS Grade: Made from Combed Sakellarides Cotton. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

TK Grade: Made from Carded Egyptian Cotton. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

PK Grade: Made from Carded Peruvian Egyptian Cotton. Frame-spun. Counts 20–1, 22¾–1. Delivered on tubes or section beams.

Any and all of these mills make special counts, plies, and put-ups on request whenever there is business sufficient to warrant it, and will quote special prices.

All the yarns made by this mill are combed yarns. To ensure the best possible quality of material for the combs the previous carding is unusually exhaustive. The Manomet Mills combing plant is the largest in the United States, and is believed to be the largest in the world, so far as our latest figures go

NONQUITT SPINNING COMPANY

DESCRIPTION OF GRADES

SA Grade: Made from staple, selected, Combed American Cotton. Frame-spun. In Nos. 26 to 40 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

SAE Grade: Made from Combed American Cotton of longer staple than the *SA*. Frame-spun. In Nos. 35 to 60 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

A Grade: Made from Combed American Cotton of longer staple than the *SAE*. Frame-spun. In Nos. 50 to 70 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

AX Grade: Made from Combed American Cotton of longer staple than the *A*. Frame-spun. In Nos. 60 to 80 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams. For yarns of super quality.

EE Grade: Made from Combed Egyptian Cotton of long staple. Frame-spun. In Nos. 30 to 60 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams.

TYR Grade: Made from Combed Sakellarides Cotton. Frame-spun. In Nos. 30 to 100 in single and ply, put up on cones, tubes, skeins, ball-warps and section beams. Used for yarns where strength or very fine count is required.

Any and all of these mills make special counts, plies, and put-ups on request, whenever there is business sufficient to warrant it, and will quote special prices.

ACADIA MILLS

MERCERIZED YARNS

BM Grade: Made from Combed American Cotton. Frame-spun. In Nos. 3 to 26 in ply. Mercerized in natural color and in bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps.

XM Grade: Made from Combed American Cotton, longer in staple than the *BM*. Frame-spun. In Nos. 26 to 40 in ply. Mercerized, in natural color and in bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps. Also in No. 30 in single. Mercerized, in natural color and bleached or dyed, on cones.

AM Grade: Made from Combed American Cotton, longer in staple than the *XM*. Frame-spun. In Nos. 10 to 70 in ply. Mercerized, in natural color and in bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps. Also in Nos. 40, 50 and 60 in single. Mercerized, in natural color and bleached or dyed, on cones.

XL Grade: Made from Combed American Cotton of very long staple, specially selected. Frame-spun. In counts, Nos.70 and 80 in ply. Mercerized, in natural color and in bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps. Also in Nos. 70 and 80 single. Mercerized, in natural color and bleached or dyed, on cones.

XY Grade: Made from the Combed Sakellarides Cotton. Frame-spun. In Nos. 10 to 80 in ply. Mercerized, in natural color and in bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps. Also in Nos. 70 and 80 single. Mercerized, in natural color and bleached or dyed, on cones.

Any and all of these mills make special counts, plies, and put-ups on request, whenever there is business sufficient to warrant it, and will quote special prices.

ACADIA MILLS

BLEACHED YARNS

BM Grade: Made from Combed American Cotton. Frame-spun. In Nos. 10 to 24 in single and to No. 26 in ply. Bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps.

CP Grade: Made from Combed American Cotton of longer staple than the *BM*. Frame-spun. In Nos. 25 to 30 in single, and to No. 40 in ply. Bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps.

CP Special Grade: Made from Combed American Cotton of longer staple than the *CP*. Frame-spun. In Nos. 32 to 60 in single and ply. Bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps.

XP Grade: Made from Combed American Cotton of longer staple than *CP Special*. Frame-spun. In Nos. 70 and 80 in single and ply. Bleached or dyed, gassed or ungassed. Put up on cones, tubes, skeins and ball-warps.

Any and all of these mills make special counts, plies, and put-ups on request, whenever there is business sufficient to warrant it, and will quote special prices.

THREAD YARNS

MANOMET MILLS
NONQUITT SPINNING COMPANY
ACADIA MILLS

While the above mills do not make a business of manufacturing the full line of thread yarns, they each of them do make a large quantity of special thread yarns in the single, two, three and four-ply, regular and reverse twist, for the shoe trade and for the manufacturing trade, among which are the following:

Manomet Mills

SS Grade

8½/1 regular twist
18½/1 and 18½/2 regular twist

Nonquitt Spinning Company

A Grade and TYR Grade

30/3 and 30/4 reverse twist
36/3 and 36/4 reverse twist
40/3 and 40/4 reverse twist
50/3 and 50/4 reverse twist
60/3 and 60/4 reverse twist

Acadia Mills

AM Grade

36/2 and 36/3 mercerized and gassed and mercerized, reverse twist

XY Grade

40/2 and 40/3 mercerized and gassed and mercerized, reverse twist

The mills will be glad to consider the manufacture of any specialties in thread yarns wherever the business is sufficient to warrant.

Gathering the Cotton Crop

Charts of Combed Cotton Yarns

The following charts show the Combed Cotton Yarns made regularly by the Manomet Mills, New Bedford, Mass.; the Nonquitt Spinning Company, New Bedford, Mass.; and the Acadia Mills, Lawrence, Mass.; in the grades described on the preceding pages

The Cotton Grading Room of the Manomet Mills. Light, color, atmosphere, and all other conditions in this room are probably the best existing in the United States for the work of grading and selecting cotton

View of Roving Room, Manomet Mills. This shows only a part of the great space

SPECIAL PACKING CASES
USED BY
MANOMET MILLS

COP CASES

Size of Cops Inches	Gross Weight of Case Pounds	Inside Measurements Inches
1½ Cops	370	40 x 21½ x 31
1¾ Cops	452	39 x 24½ x 33½
¾ Pin Cops	476	39 x 24½ x 33½
1¾ Cops	320	31¼ x 24 x 31¼
⅞ Pin Cops	390	38 x 32 x 31
2 Pin Cops	480	38½ x 37½ x 28½

CONE CASES

Size of Cone Inches	Number of Cones in Case	Gross Weight of Case Pounds	Inside Measurements Inches
6½	144	400	37 x 26¾ x 33
6½	168	510	45 x 34½ x 23¼
6½	168	462	42¾ x 34½ x 23¼

TUBE CASES

Size of Tube Inches	Number of Tubes in Case	Gross Weight of Case Pounds	Inside Measurements Inches
4	200	361	32¾ x 32 x 19½
4¼	175	380	32¾ x 32 x 19½
4½	165	350	32¾ x 32 x 19½
4¾	140	350	32¾ x 32 x 19½
4¾	216	400	41½ x 26½ x 26½
4¼	252	390	41½ x 26½ x 26½

CASES FOR SKEINS

	Gross Weight of Case Pounds	Inside Measurements Inches
Skeins	390	45 x 34½ x 23¼
Skeins	500	45 x 34½ x 23¼
Skeins	300	32¾ x 32 x 19½

Special Packing for Export

MILL PRODUCTS *in* COMBED COTTON YARNS FOR KNITTING, *In the Gray*

		Single Knitting on Cops	Single Knitting on Cones	Single Knitting in Skeins	Single Lisle on Cones	Single Lisle in Skeins	Two-ply Lisle Twist on Cones	Two-ply Lisle Twist in Skeins	Two-ply Soft Twist on Cones	Two-ply Soft Twist in Skeins		
		Counts	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*		
Manomet	BB	4 to 30	4 to 30	4 to 30	. . .	. . .	. . .	. . .	4 to 30	4 to 30	BB	Manomet
Manomet	CC	.	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	CC	Manomet
Manomet	TE	.	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	TE	Manomet
Manomet	SS	.	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	SS	Manomet
Manomet	PC	10 to 30	.	.	.	.	.	.	.	.	PC	Manomet
Nonquitt	SA	.	26 to 40	26 to 40	26 to 40	26 to 40	26 to 40	26 to 40	26 to 40	26 to 40	SA	Nonquitt
Nonquitt	SAE	.	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	SAE	Nonquitt
Nonquitt	A	.	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	A	Nonquitt
Nonquitt	AX	.	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	AX	Nonquitt
Nonquitt	EE	.	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	EE	Nonquitt
Nonquitt	TYR	.	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	TYR	Nonquitt

All of the above two-ply yarns can be supplied gassed if desired

PROCESSED

		Single Bleached or Dyed on Cones	Single Bleached or Dyed in Skeins	Two-ply Bleached or Dyed on Cones	Two-ply Bleached or Dyed in Skeins	Single Mercerized on Cones	Single Mercerized in Skeins	Two-ply Mercerized on Cones	Two-ply Mercerized in Skeins		
		Counts	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*		
Acadia	BM	10 to 24	10 to 24	10 to 26	10 to 26	. . .	. . .	3 to 26	3 to 26	BM	Acadia
Acadia	CP	25 to 30	25 to 30	25 to 30	25 to 30	. . .	. . .	. . .	. . .	CP	Acadia
Acadia	Sp. CP	32 to 60	32 to 60	32 to 60	32 to 60	. . .	. . .	. . .	. . .	CP Sp.	Acadia
Acadia	XP	. . .	. . .	70 and 80	70 and 80	. . .	. . .	. . .	. . .	XP	Acadia
Acadia	XM	. . .	. . .	. . .	. . .	30	30	26 to 40	26 to 40	XM	Acadia
Acadia	AM	. . .	. . .	. . .	. . .	40 50 60	40 50 60	40 to 70	40 to 70	AM	Acadia
Acadia	XL	. . .	. . .	. . .	. . .	70 and 80	70 and 80	70 and 80	70 and 80	XL	Acadia
Acadia	XY	. . .	. . .	. . .	. . .	. . .	. . .	10 to 100	10 to 100	XY	Acadia

All of the above two-ply yarns can be supplied gassed if desired
All the mercerized yarns can be supplied in bleached and also in colors, both gassed and ungassed
Special counts and plies made on request, both in gray and in processed whenever there is business sufficient to warrant it

Any desired counts in any grades and in any desired put-up besides these staple goods shown here, can be furnished by the William Whitman Company on order

MANOMET MILLS TIRE YARN

		Single on Tubes	Single on Section Beams
		Counts	*Counts*
CC	Combed	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$
DD	Combed	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$
TE	Combed	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$
PE	Combed	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$
SS	Combed	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$
PK	Carded	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$
PK	Carded	20 and $22\frac{3}{4}$	20 and $22\frac{3}{4}$

Also special cord yarns for cord fabrics.
Special counts and plies made on request, whenever there is business sufficient to warrant it.

MILL PRODUCTS *in* COMBED COTTON YARNS FOR WEAVING, *In the Gray*

		Single Warp or Filling Tubes	Single Warp or Filling Skeins	Single Warp or Filling Ball Warps	Single Warp Section Beams	Two-ply Warp Twist Tubes	Two-ply Warp Twist Skeins	Two-ply Warp Twist Ball Warps	Two-ply Warp Twist Section Beams	Two-ply Soft Twist Tubes	Two-ply Soft Twist Skeins	Two-ply Soft Twist Ball Warps	Two-ply Soft Twist Section Beams		
		Counts	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*		
Manomet	CC	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	CC	Manomet
Manomet	TE	4 to 30	4 to 30	4 to 30	4 to 50	4 to 30	4 to 30	4 to 50	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	TE	Manomet
Manomet	SS	4 to 30	4 to 30	4 to 30	4 to 50	4 to 30	4 to 30	4 to 50	4 to 30	4 to 30	4 to 30	4 to 30	4 to 30	SS	Manomet
Nonquitt	SA	26 to 35	26 to 35	26 to 35	26 to 35	26 to 30	26 to 30	26 to 30	26 to 30	26 to 40	26 to 40	26 to 30	26 to 30	SA	Nonquitt
Nonquitt	SAE	35 to 40	35 to 40	35 to 40	35 to 40	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	35 to 60	SAE	Nonquitt
Nonquitt	A	40 to 60	40 to 60	40 to 60	40 to 60	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	50 to 70	A	Nonquitt
Nonquitt	AX	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	60 to 80	AX	Nonquitt
Nonquitt	EE	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	30 to 60	EE	Nonquitt
Nonquitt	TYR	30 to 80	30 to 80	30 to 80	30 to 80	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	30 to 100	TYR	Nonquitt

All of the above two-ply yarns can be supplied gassed if desired

PROCESSED

		Single Bleached or Dyed Tubes	Single Bleached or Dyed Skeins	Single Bleached or Dyed Ball Warps	Single Bleached or Dyed Section Beams	Two-ply Bleached or Dyed Tubes	Two-ply Bleached or Dyed Skeins	Two-ply Bleached or Dyed Ball Warps	Two-ply Bleached or Dyed Section Beams	Two-ply Mercerized on Tubes	Two-ply Mercerized in Skeins	Two-ply Mercerized in Ball Warps	Two-ply Mercerized on Section Beams		
		Counts	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*	*Counts*		
Acadia	BM	10 to 24	10 to 24	10 to 24	10 to 24	10 to 26	10 to 26	10 to 26	10 to 26	4 to 26	4 to 26	4 to 26	4 to 26	BM	Acadia
Acadia	CP	25 to 30	25 to 30	25 to 30	25 to 30	25 to 40	25 to 40	25 to 40	25 to 40	. . .	. . .	. . .	. . .	CP	Acadia
Acadia	Sp. CP	32 to 60	32 to 60	32 to 60	32 to 60	32 to 60	32 to 60	32 to 60	32 to 60	. . .	. . .	. . .	. . .	CP Sp.	Acadia
Acadia	XP	. . .	. . .	. . .	. . .	70 and 80	70 and 80	70 and 80	70 and 80	. . .	. . .	. . .	. . .	XP	Acadia
Acadia	XM	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	26 to 40	26 to 40	26 to 40	26 to 40	XM	Acadia
Acadia	AM	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	40 to 70	40 to 70	40 to 70	40 to 70	AM	Acadia
Acadia	XL	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	70 and 80	70 and 80	70 and 80	70 and 80	XL	Acadia
Acadia	XY	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	10 to 100	10 to 100	10 to 100	10 to 100	XY	Acadia

All of the above two-ply yarns can be supplied gassed if desired
All the mercerized yarns can be supplied in bleached and also in colors, both gassed and ungassed
Special counts and plies made on request, both in gray and in processed whenever there is business sufficient to warrant it

Any desired counts in any grades and in any desired put-up besides these staple goods shown here, can be furnished by the William Whitman Company on order

SPECIAL PACKING CASES
USED BY
NONQUITT SPINNING COMPANY

CONE CASES

	Gross Weight of Case Pounds	Inside Measurements Inches
Single Cones Universal	530	38½ x 37½ x 27½
Single Cones Camless	470	38½ x 37½ x 27½
Ply Cones	500	40¾ x 36½ x 27½

TUBE CASES

	Gross Weight of Case Pounds	Inside Measurements Inches
Single Tubes	430	35½ x 33½ x 27½
Ply Tubes	500	35½ x 33½ x 27½

SKEIN CASES

	Gross Weight of Case Pounds	Inside Measurements Inches
Ordinary Skeins	500	40¾ x 36½ x 27½
Thread Yarn Skeins	330	32 x 26 x 24½

Special Packing for Export

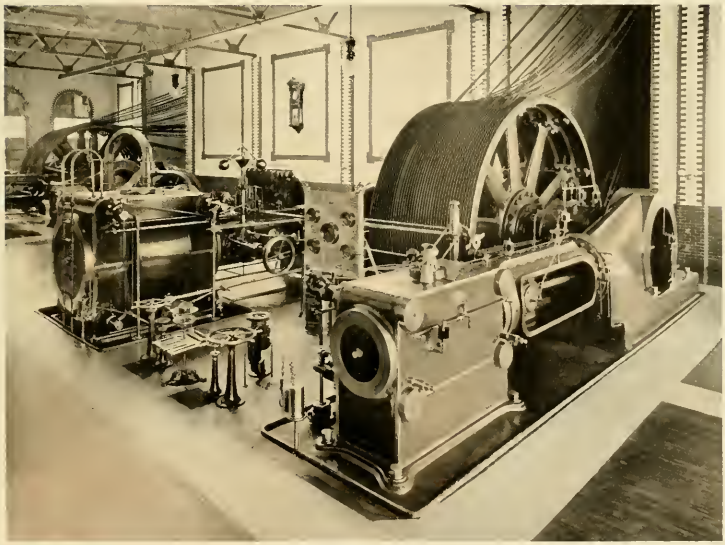
SPECIAL PACKING CASES
USED BY
ACADIA MILLS

CONE CASES

Description of Yarn	Approximate Gross Weight of Case Pounds	Inside Measurements Inches
Single Bleached	350	42 x 28 x 26
or	400	44 x 30 x 26
Single Mercerized	450	42 x 28 x 26
Two-ply Mercerized	500	44 x 30 x 26

SKEIN CASES

Description of Yarn	Approximate Gross Weight of Case Pounds	Inside Measurements Inches
All Descriptions	500	42 x 28 x 26
	600	44 x 30 x 26



Engine Room in the Nonquitt Spinning Company Mills, New Bedford, Mass.

Department
of
Carded Cotton Yarn

CARDED COTTON YARNS DEPARTMENT

of the

WILLIAM WHITMAN COMPANY, INC.

COVERING THE GENERAL AMERICAN MARKET
AS TRADERS IN CARDED COTTON YARNS

In this division of their business the William Whitman Company act as commission merchants for a number of mills for whom they are exclusive selling agents. They also act as general market buyers and sellers of the product of many other mills so that through this department and their wide connections they are able to offer a line of carded yarns of southern and northern manufacture covering practically all grades and for all purposes.

In the yarn which they strictly sell on commission their whole aim is, as in their combed yarn department, to have the mills manufacture a yarn which shall be of the very best of its class. On the yarns from spinners with whom they act as dealers, intimate touch with both the manufacturing and selling ends of the market is maintained in two chief ways:

First, through close business and personal connections with some 250 spinning mills, representing a total of more than 3,000,000 spindles.

Second, through similarly close business and personal connections with the general users of yarn throughout the whole United States.

This makes possible the double service on which the department is based, a service whose principle is that continuous and profitable business relations can be retained only when transactions are equally useful to producer and consumer. The wide field of the company's business in fabrics of both cotton and wool manufacture gives to their clients the advantage of a broad-gauged view of the whole textile market and also enables the company often to put before the spinner unexpected or uncommon opportunities which otherwise would remain unknown to him.

To the user, the company can offer the results of their own experience in the product of the various mills with whom they have these connections, thus enabling their clients to meet their demands with the best yarns available for their purpose.

To this same end the company offers to their buyers, when desired, the results of their testing laboratories and inspection departments, which are equipped to examine and approve all materials under exact

atmospheric conditions. Every carded cotton yarn for any purpose is handled, and can be furnished in counts ranging from as heavy as No. 4 to as fine as No. 60 both in single and plys. Plys as high as 66-ply can be obtained in some grades.

In quality these yarns run through all the grades from the very highest grade of American peeler to the lowest grades of cotton or waste. While they are made mostly in regular standard warp, filling and knitting twists, yarns in all kinds of special twist can be furnished.

Put-ups cover the whole range, from cones, cops and skeins (in soft twist) for the knitting trade, to skeins, ball-warps, chain-warps, section beams, tubes and cones for the weaving and other trades.

In southern yarns the company delivers three qualities—*A*, *B* and *C*.

A Quality is the highest grade yarn spun for the manufacture of the highest grade carded goods. This yarn is made out of white cotton, evenly spun and evenly twisted.

B Quality is also made out of white cotton but is not so exhaustively carded and, therefore, not so free from specks nor is it as evenly spun.

C Quality is made from off-colored cottons, and, in some cases, from waste cotton.

CHARTS OF CARDED COTTON YARNS

The following charts show the Carded Cotton Yarns which are handled by William Whitman Company, Inc. Any desired counts in any grades and in any desired put-up besides these shown here can be furnished by William Whitman Company, Inc., on order

A GRADE

Counts	Cones	Skeins	Tubes	Ball Warps	Chain Warps	Section Beams	Cones	
4's	. . . . .	4/1 to 4 ply	4/1 to 4 ply	. . . . .			. . . . .	4/
6's	. . . . .	6/1 to 6 ply	6/1 to 6 ply	. . . . .			6/1 to 6 ply	6/
7's	. . . . .	7/1 to 7 ply	7/1 to 7 ply	. . . . .			7/1 to 7 ply	7/
8's	8/1 to 3 ply	8/1 to 8 ply	8/1 to 8 ply	8/1 to 3 ply	8/1 to 3 ply	. . . . .	8/1 to 4 ply	8/
10's	10/1 to 5 ply	10/1 to 8 ply	10/1 to 8 ply	10/1 to 8 ply	10/1 to 8 ply	. . . . .	10/1 to 8 ply	10/
12's	12/1 to 6 ply	12/1 to 6 ply	12/1 to 6 ply	12/1 to 4 ply	12/1 to 4 ply	12/1	12/1 to 6 ply	12/
14's	14/1 to 3 ply	14/1 to 4 ply	14/1 to 4 ply	14/1 to 3 ply	14/1 to 3 ply	. . . . .	14/1 to 3 ply	14/
16's	16/1 to 3 ply	16/1 to 5 ply	16/1 to 5 ply	16/1 to 2 ply	16/1 to 2 ply	16/1	16/1 to 3 ply	16/
20's	20/1 to 2 ply	20/1 to 5 ply	20/1 to 5 ply	20/1 to 2 ply	20/1 to 2 ply	20/1	20/1 to 2 ply	20/
24's	24/1 to 3 ply	24/1 to 3 ply	24/1 to 3 ply	24/1 to 2 ply	24/1 to 2 ply	24/1	24/1 to 3 ply	24/
26's	26/1 to 2 ply	26/1 to 2 ply	26/1 to 2 ply	26/1 to 2 ply	26/1 to 2 ply	26/1	26/1 to 2 ply	26/
30's	30/1 to 3 ply	30/1 to 3 ply	30/1 to 3 ply	30/1 to 2 ply	30/1 to 2 ply	30/1	30/1 to 2 ply	30/
36's	. . . . .	36/2 to 3 ply	36/2 to 3 ply	. . . . .			. . . . .	
40's	40/1	40/1 to 2 ply	40/1 to 2 ply	40/1 to 2 ply	40/1 to 2 ply	. . . . .	. . . . .	
50's	50/1 to 2 ply	50/1 to 2 ply	50/1 to 2 ply	50/2	. . . . .		. . . . .	.
60's	60/1 to 2 ply	60/1 to 2 ply	60/1 to 2 ply	60/1 to 2 ply	. . . . .		. . . . .	.

We sell cable tubes and skeins up to 20's, for tire yarns and fire
Any special counts and plies can be furnished

SPECIALTIES

Tire Fabric Yarns

Yarns for Electrical Purposes

Yarns for Webbing Manufacturers

Special Packing for Export

AVING YARNS

B GRADE				C GRADE			
Tubes	Ball Warps	Chain Warps	Section Beams	Cones	Skeins	Tubes	Counts
y 4/1 to 4 ply					4/1 to 4 ply	4/1 to 4 ply	4's
y 6/1 to 6 ply				6/1	6/1 to 6 ply	6/1 to 6 ply	6's
y 7/1 to 7 ply				7/1	7/1 to 7 ply	7/1 to 7 ply	7's
y 8/1 to 8 ply	8/1 to 4 ply	8/1 to 4 ply		8/1 to 8 ply	8/1 to 8 ply	8/1 to 8 ply	8's
y 10/1 to 8 ply		10/1 to 5 ply		10/1 to 8 ply	10/1 to 8 ply	10/1 to 8 ply	10's
y 12/1 to 6 ply	12/1 to 4 ply	12/1 to 4 ply	12/1	12/1 to 4 ply	12/1 to 4 ply	12/1 to 4 ply	12's
y 14/1 to 3 ply	14/1 to 2 ply	14/1 to 2 ply		14/1	14/1 to 3 ply	14/1 to 3 ply	14's
y 16/1 to 4 ply	16/1 to 2 ply	16/1 to 2 ply	16/1	16/1	16/1 to 3 ply	16/1 to 3 ply	16's
y 20/1 to 5 ply	20/1 to 2 ply	20/1 to 5 ply	20/1	20/1 to 2 ply	20/1 to 2 ply	20/1 to 2 ply	20's
y 24/1 to 3 ply	24/1 to 2 ply	24/1 to 2 ply	23/1—24/1	24/2	24/2	24/2	24's
y 26/1 to 2 ply	26/1 to 2 ply	26/1 to 2 ply	26/1	26/2	26/2	26/2	26's
y 30/1 to 2 ply	30/1 to 2 ply	30/1 to 2 ply	30/1	30/2	30/2	30/2	30's
36/2							36's
40/2	40/2	40/2					40's
							50's
							60's

den hose. We sell two-end regular tubes, for electrical trade
ver there is business sufficient to warrant it

CARDED COTTON KNITTING YARNS

A GRADE			B GRADE		C GRADE		
Counts	Cones	Skeins	Cones	Skeins	Cones	Skeins	Counts
6/1	6/1	6/1	6/1	6/1	6/1	6/1	6/1
7/1	7/1	7/1	7/1	7/1	7/1	7/1	7/1
8/1	8/1	8/1	8/1	8/1	8/1	8/1	8/1
9/1	9/1	9/1	9/1	9/1	9/1	9/1	9/1
10/1	10/1	10/1	10/1	10/1	10/1	10/1	10/1
11/1	11/1	11/1	11/1	11/1	11/1	11/1	11/1
12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1
14/1	14/1	14/1	14/1	14/1	14/1	14/1	14/1
15/1	15/1	15/1	15/1	15/1	15/1	15/1	15/1
16/1	16/1	16/1	16/1	16/1	16/1	16/1	16/1
18/1	18/1	18/1	18/1	18/1	. . .	. . .	18/1
20/1	20/1	20/1	20/1	20/1	. . .	. . .	20/1
22/1	22/1	22/1	22/1	22/1	. . .	. . .	22/1
24/1	24/1	24/1	24/1	24/1	. . .	. . .	24/1
26/1	26/1	26/1	26/1	26/1	. . .	. . .	26/1
28/1	28/1	28/1	28/1	28/1	. . .	. . .	28/1
30/1	30/1	30/1	30/1	30/1	. . .	. . .	30/1
32/1	32/1	32/1	. . .	. . .	. . .	. . .	32/1
40/1	40/1	40/1	. . .	. . .	. . .	. . .	40/1
50/1	50/1	50/1	. . .	. . .	. . .	. . .	50/1

Any special counts can be furnished whenever there is business sufficient to warrant it

MARY LOUISE MILLS

COWPENS, S. C.

While the southern yarn business is, as has been stated, done largely either with mills for which the company act as selling agents or on the direct method of purchase and resale, there are individual instances where the William Whitman Company, either through ownership of the majority of stock or otherwise, control the management of the mill and where they can, therefore, put into operation the same general principles that they have adopted in the northern combed yarn mills.

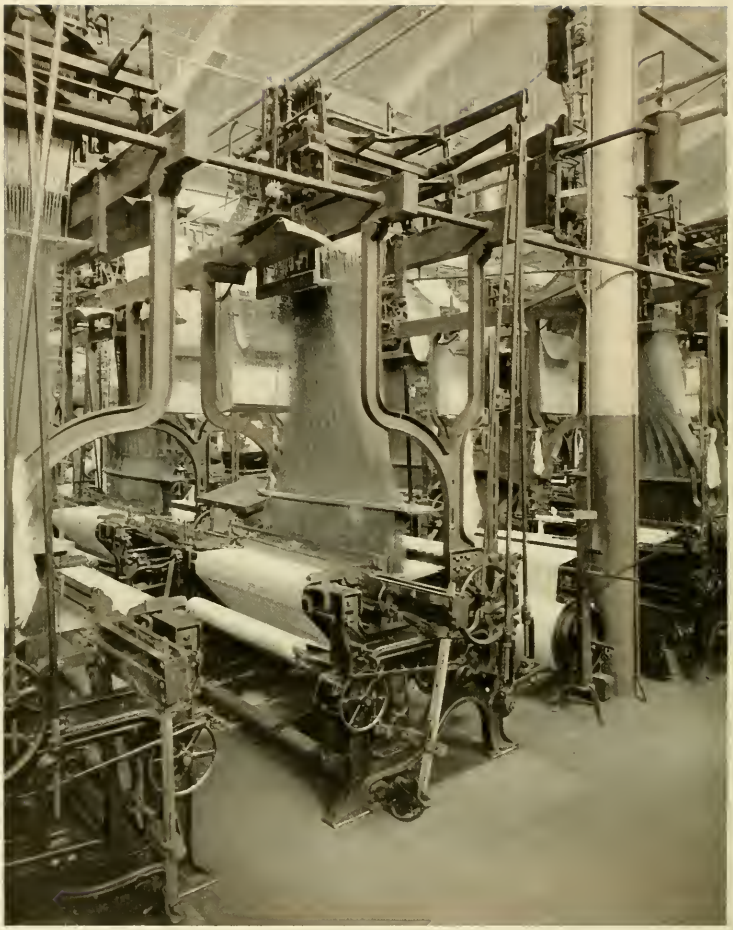
Such a mill is the Mary Louise Mills, of Cowpens, S. C. This mill, situated in the heart of the cotton growing district, specializes on 20–2 carded yarn made from strictly white cotton and put up in either skeins or warps for the weaving and webbing trade. Here, as in all the other mills that the company directly or indirectly manages, special attention is given, first, to the uniformity and grade of the cotton and then to the details of every stage of its manufacture. This is done to the end that the company may be in a position to offer to manufacturers of cotton worsteds, plush manufacturers and other similar trades where good 20–2 carded yarn is essential, a product which, because of uniformity of color and quality and superiority of spinning and put-up, will assure the user of a standard article on which he can depend for getting the maximum product and best fabric obtainable from a carded yarn of that particular number.

Nashawena Mills

New Bedford, Mass.

Nashawena Mills, New Bedford, Mass. The

SINGLE ESTABLISHMENT OF ITS KIND IN THE WORLD



Jacquard Looms, Nashawena Mills

NASHAWENA MILLS

New Bedford, Mass.

Capital Stock $3,000,000

OFFICERS

President: William Whitman ..... Boston, Mass.
Treasurer: William B. Gardner ..... New Bedford, Mass.
Agent: John L. Burton ..... New Bedford, Mass.
Clerk: J. Earle Parker ..... Boston, Mass.

DIRECTORS

I. Tucker Burr ..... Boston, Mass.
Livingston Davis ..... Boston, Mass.
Robert H. Gardiner ..... Boston, Mass.
Franklin W. Hobbs ..... Boston, Mass.
William B. Gardner ..... New Bedford, Mass.
George E. Kunhardt ..... Lawrence, Mass.
Robert A. Leeson ..... Boston, Mass.
Charles W. Leonard ..... Boston, Mass.
E. Kent Swift ..... Whitinsville, Mass.
Malcolm D. Whitman ..... New York, N. Y.
William Whitman ..... Boston, Mass.

SELLING AGENTS

William Whitman Company, Inc. Offices: 78 Chauncy Street, Boston, Mass.; 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.

NASHAWENA MILLS

New Bedford, Mass.

WILLIAM WHITMAN COMPANY, Inc.

Selling Agents

25 Madison Avenue, New York City

"Tell us what you want, and we can make it"

ALL WEAVES, PLAIN JACQUARD AND
FANCY WOVEN FABRICS
ALL COTTON, SILK AND COTTON

In the Gray

GRAY GOODS

The term Gray Goods applies generally to fabrics which have not been bleached, dyed or subjected to any other process after weaving. They are sold in the form in which they come from the loom.

Certain Gray Goods (such as sheetings, drills and ducks) frequently are retailed in their gray or natural state. The Gray Goods marketed by William Whitman Company, Inc., however, comprise for the most part only those fabrics which are manufactured especially for converters who have them dyed, bleached or printed before they reach the consumer.

As sold by the company, they fall into two broad general lines:

Fine Goods and Carded Fabrics

Fine Goods is a term used by the trade to designate fabrics of quality that are made from all combed cotton yarns or from combed cotton yarns and silk in combination, the raw material used in their construction being the better grades of both cotton and silk. They may be of the utmost simplicity or highly elaborate in texture and pattern.

Carded Fabrics are the broad range of cloths woven for the most part from carded cotton yarns spun from the shorter staples of American cotton. They include such fabrics as print cloths, sheetings and drills.

FINE GOODS, MADE IN THE GRAY BY THE NASHAWENA MILLS

New Bedford, Mass.

This is probably the largest single cotton mill of its kind in the world. Like the others of the group, it is self-contained, standing alone and making its product from beginning to end within itself. At the same time it shares in the resourcefulness of the entire group, thus commanding facilities for any need.

From raw cotton to woven product, everything is Nashawena work. Its looms are supplied with yarns, cotton and silk, made in the mills. Special yarns that may be required on occasion for unusual work or for weaves requiring processed yarns are not drawn from an outside market but from sources within the group, insuring Nashawena standard.

The range of product, both in variety and quantity of fabrics, is indicated by the fact that in their construction all the many grades of very fine long staple cottons are used, while the silks represent

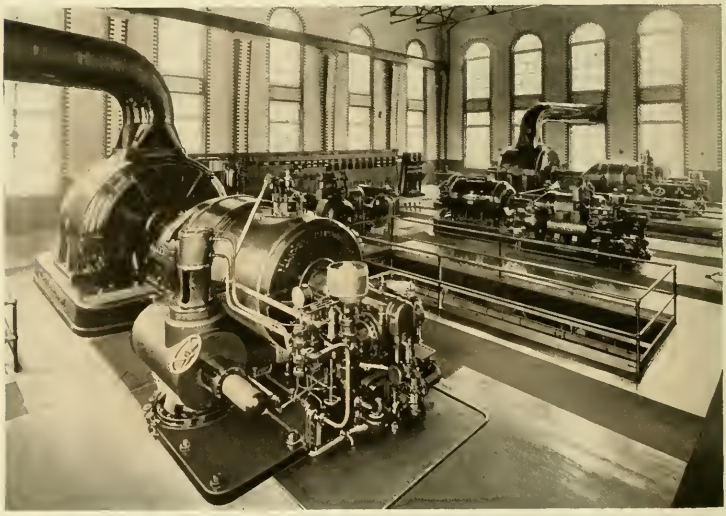
almost every known kind. They include the raw silks from Italy, China and Japan, the processed silk such as the spun silks commonly called Schappe, and the lustrous artificial silk which has become so popular.

A characteristic feature of the Nashawena Mills is the degree to which they have developed the business of carrying out and protecting the ideas of converters. The novelty for which designers strive defies cut-and-dried methods, and demands a distinct textile science. A specialized organization is needed to solve such problems; and the extraordinary number of new designs, involving practically infinite variety in both textures and patterns, demands an establishment whose plan is one of almost continual renewal by the adoption of new methods and new machineries that are essential for keeping up to date.

Originality, which is the great value of new designs, means the unusual. The Nashawena Mills are operated to cope with the unusual. Men and equipment are possessed of "mobility"—the versatility that has enabled the mills to say to users of textiles:

"Tell us what you want, and we can make it"

It is many years since this declaration was made. Fashion and art have put it abundantly to the test. The mills have always "made it."



Turbines in the Nashawena Mills Power House

Men who stake the chances of a whole season or more on special designs, depend in unusual degree on the mill that does the work.

Their ideas must be protected absolutely.

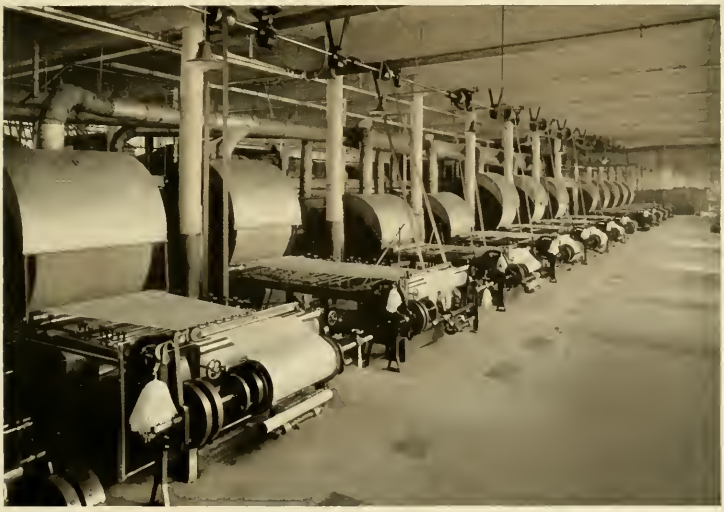
The perfect execution of the designs must not be endangered by equipment that fails in being up to date.

The quality of the fabric must be assured beforehand by the known reputation and success of the mill.

Specializing as they do in this work, the Nashawena Mills can produce for converters and others any beautiful fabric in cotton, in silk, or in both, in any texture, in any design, and embodying almost any idea. Nashawena looms range from 36 to 66 inches in width and are of such variety that they can make every kind of plain, Jacquard or fancy fabric. Many of the looms installed here for high-class novelties have no counterpart in the United States.

SILK AND COTTON FABRICS

The manufacture of silk and cotton mixed fabrics has developed rapidly in this country because it has been found that materials of true beauty and permanent value can be produced at far less cost than



Slashing Machines, Nashawena Mills

the expensive silks. These fabrics are constructed not to take the place of silk, but to supplement the range of silk fabrics and fill a demand that has grown with the consuming public. The silk and cotton fabric is in no sense an imitation or a substitute. It stands in a class by itself, and is represented by a range of beautiful and useful cloths that have distinct value.

The fact that a silk is used makes it essential that the whole fabric shall grade up to this expensive component part. There is economy in using cotton with silk only if the two materials so correspond in quality, though of different substance, that they produce a rich fabric. Economy is squandered the moment a cotton in such a textile lowers its tone, for the purpose of cotton and silk mixture is to produce a handsome fabric at lessened cost, not a low-grade fabric whose chief merit is cheapness.

NASHAWENA YARNS

"Good weaving begins in the yarn mill."

A weaver's skill and honesty may measurably remedy imperfections in yarn, but his best efforts cannot transform inadequate yarns into adequate fabrics.

In Fine Goods, beauty is a controlling business factor. If they cannot be sold upon their appearance (which means that indefinable but unmistakable something that comes only from quality), they are "seconds" in effect if not in name.

A slight defect in a yard of fine yarn may be quite invisible, but many thousand yards of yarn go into a yard of fabric. A defect many thousand times repeated is not invisible.

The Nashawena Mills perform every function that enters into producing woven fabric from the raw material. All the processes of selection and grading of raw material, combing, spinning and weaving are conducted; and the mills maintain one of the largest spinning establishments in the country though not an ounce of their yarns is made for sale.

Though the magnitude of the spinning operations makes possible a highly economic production, the leading object of Nashawena spinning is yarn that shall maintain the quality in woven fabrics which makes the name "Nashawena" an accepted guaranty.

SILK

Because of the importance of silk mixture in cotton textiles, the silk department of the Nashawena Mills was an organic part of

the establishment in its erection. All material enters it in the raw state and the processes are for the one purpose of supplying the weave-room. None of the silk department's product is for sale, and thus there is eliminated every extraneous manipulation, such as loading. Nashawena silk yarn manufacture looks only to develop and retain the best natural qualities, in order to produce silk warp and filling of the highest uniform character. From the opening and oiling of the raw hanks through every succeeding process, all that is done is dictated singly from the view of the textile fabric that is to be produced, and for maintaining the same quality whether the output be a single piece or a thousand.

WEAVING

It is a common saying that the modern power-loom can "weave by itself." This is true. It is true that a whole roomful of looms can "weave by themselves." But they cannot make good cloth by themselves. As the products of the old hand-looms varied in beauty and quality according to the varying abilities of the weavers, so do the products of the modern machineries. Indeed, with the speed and vast productiveness of modern weave-room equipment, human skill and alertness have become more important than ever they were in the older days.

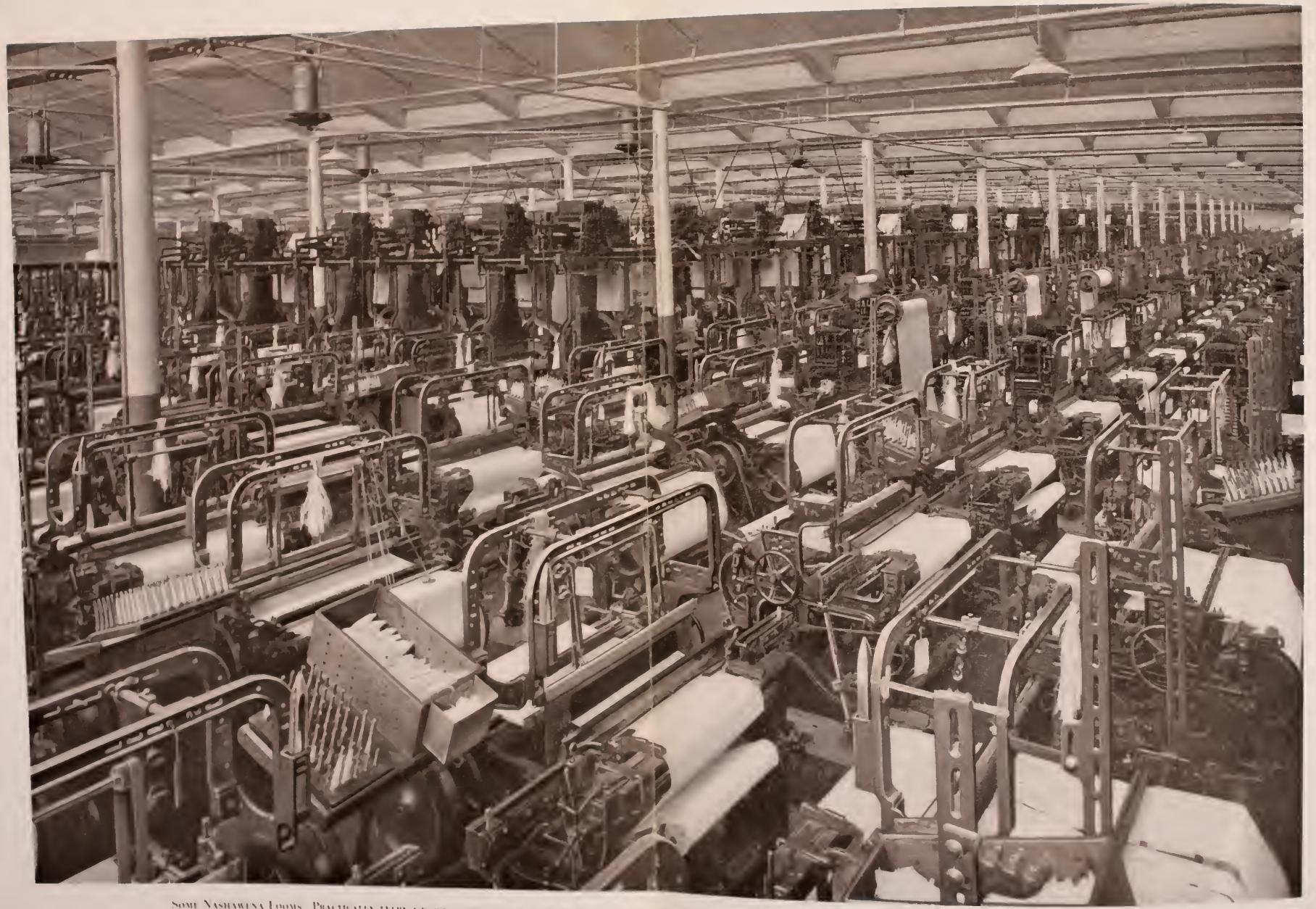
The Nashawena weave-room has such an expanse that an observer at one end can see the other end only vaguely with the naked eye. In that space are more than 4000 looms. This imposing mass of power equipment does the mechanical work—the drudgery. Unwearying, it lays warp and weft far more accurately than the human hand could do it. But there its ability ends. Machinery has no intelligence and no conscience. It is neither honest nor dishonest. Honesty in product, which means Quality, can be obtained solely through honest human organization.

The manufacture of uniformly good textile fabric involves a literally incessant war for results. A defective fabric cannot be cured. It can only be patched. Prevention is the only cure in a cotton mill, as in medicine, and prevention means unflagging human zeal.

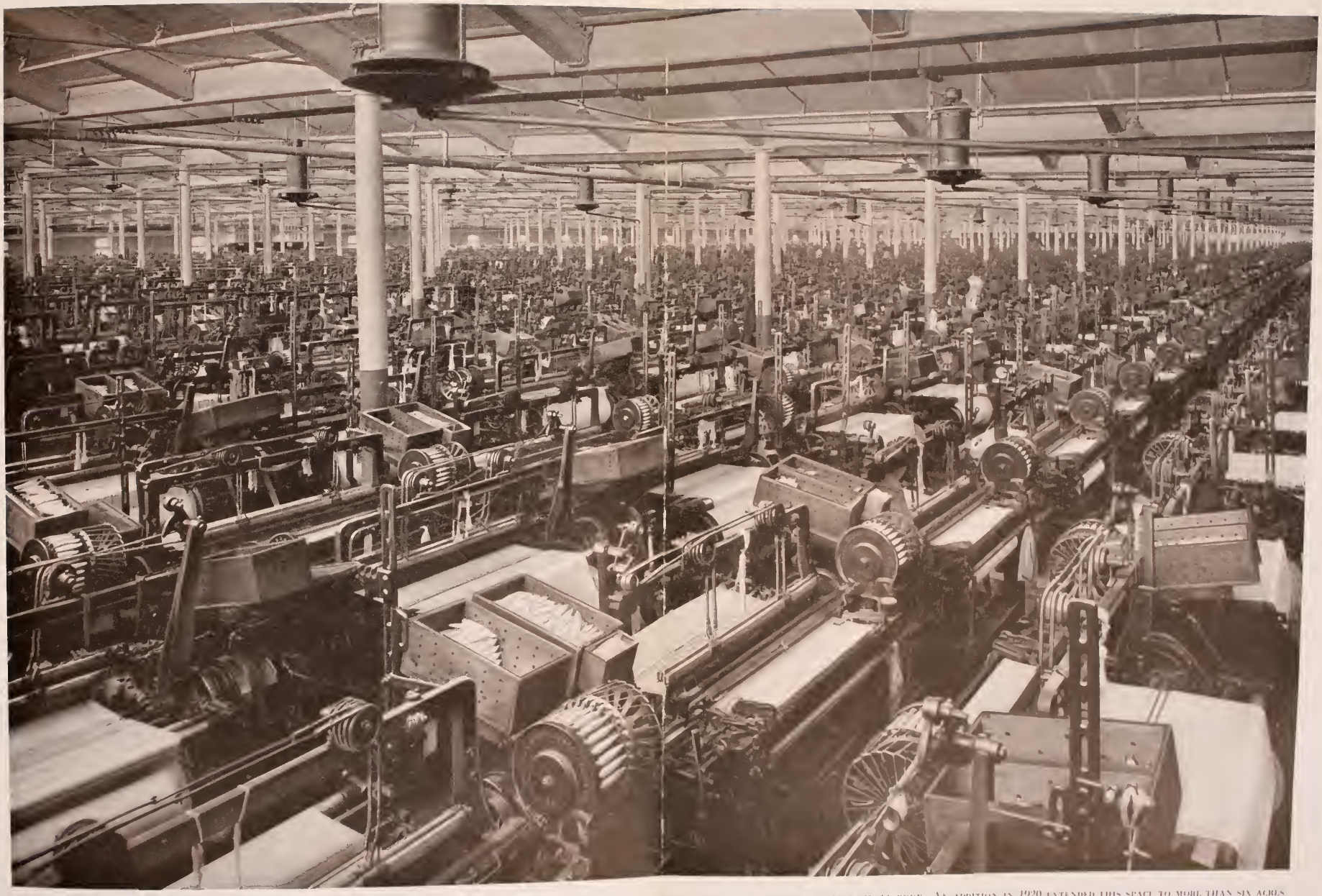
In the trade there has always been more or less reference to Nashawena "trade-secrets." It is true that the mills have such secrets and that some are most useful. But the truly important Nashawena secret is its system. Nashawena quality in product begins with Nashawena quality in its workers.

Office and Power House, Nashawena Mills, New Bedford, Mass.

Exterior of Nashawena Mills



Some Nashawena Looms. Practically every known useful variety and size of loom is represented in the equipment of this mill. The total number of the looms exceeds 4000



A Partial View of a Weave Room in the Nashawena Mills. One weave room in these mills has floor space of five and one-third acres, all under a single roof. An addition in 1920 extended this space to more than six acres

Frame Spinning Room, Nashawena Mills. Although the Nashawena Mills manufacture yarn exclusively for their own weave rooms, the yarn-spinning departments are the most extensive in the country

SOME STAPLES

Besides the ever-increasing and therefore really limitless variety of fancy fabrics, the Nashawena Mills are among leading producers of those fabrics commonly called Staples, such as venetians, voiles, crêpes, lawns and organdies.

VENETIANS

The value of this staple, whether all cotton or decorated with silk, depends primarily on its being so constructed as to take a lustrous finish. To achieve this characteristic is a problem that involves correct selection and preparation of raw material, yarn-spinning and weaving together.

It is pre-eminently a textile that needs intelligent work by all concerned in producing it in the gray. The effect that the finisher has in mind can be obtained by him only if the mill works scientifically toward that end. Every kind of finish requires differences of method in manufacture.

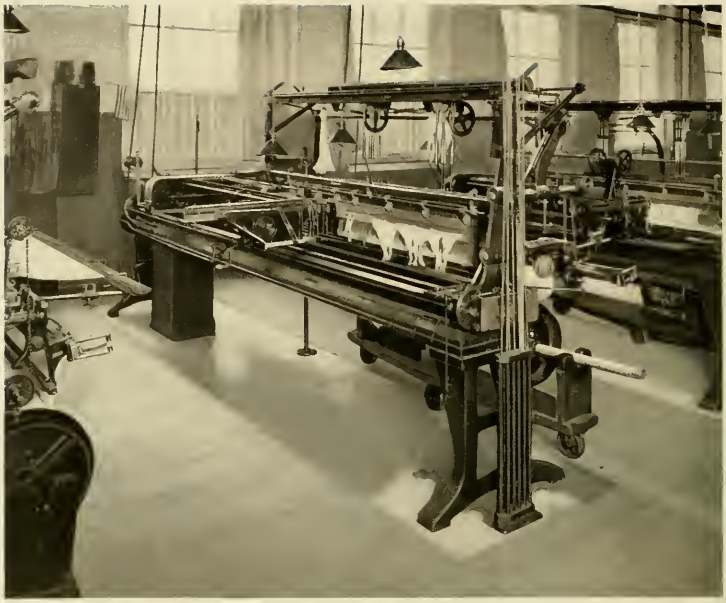
Correct manufacture in the gray is essential to make a product that can be finished economically by the converter. The venetian in the gray that runs evenly throughout, facilitates and smoothes the processes between the converter and the finishing plant, which means lessened cost, and gives the customer a fabric that is distinguished by a luster that has not only brilliancy but body.

The Nashawena Mills today market a product that admittedly can accept jealous scrutiny in comparison with the famous venetians which have been imported for so many years. The mill venetians run in two classes—single and two-ply. They are made in both plain and Jacquard weaves, and in limited quantities with decorations of silk.

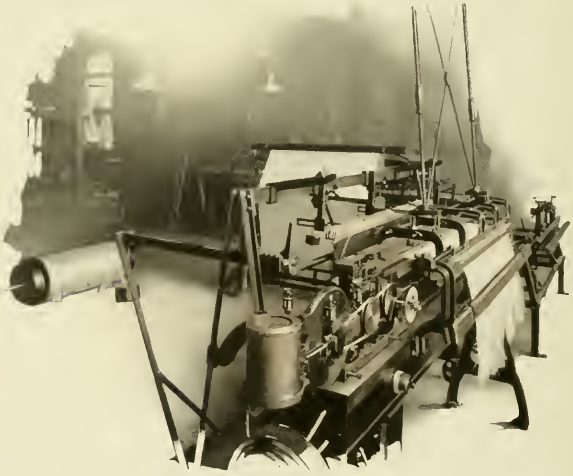
VOILES

Nashawena voiles have a reputation so familiar to buyers of this fabric that it seems merely necessary to say that there have been many years of concentration on producing a voile yarn that shall be exactly right, and that the mills maintain workers whose tenure of employment has made them expert for this particular product.

The good reputation of Nashawena single yarn voiles is not only because of quality alone, but because the quality has the commercial value of being of uniform standard throughout the whole great quantity that is produced annually. Skill in the manufacture of single yarn voiles in this country has developed remarkably. According to one of the best informed manufacturers in Europe, the single yarn voiles produced in the Nashawena Mills have no superior in the world.



Drawing-in Machine, Nashawena Mills



Drawing Warp in, Nashawena Mills

CRÊPES

The value of this fabric is in the "crinkle" which it assumes in finishing. Unfortunately for the converter, he cannot very well tell beforehand, when he buys the goods in the gray, whether they have been woven correctly, with yarns of the right resiliency and twist. He cannot find out till he has put the fabric through his expensive process.

No amount of skill or expenditure of effort and money can make a good crêpe out of a gray fabric that does not contain the proper yarns. Therefore the purchaser of crêpe in the gray has to depend on the mill, and any looseness or lack of skill and equipment there is likely to be disastrous, for to make a good crêpe it is necessary to handle on the looms many threads of sharply varying character of twist, laid in accordance with formulas which often are complex. Crêpe production in the Nashawena Mills is specialized and many of the methods and equipments are exclusive.

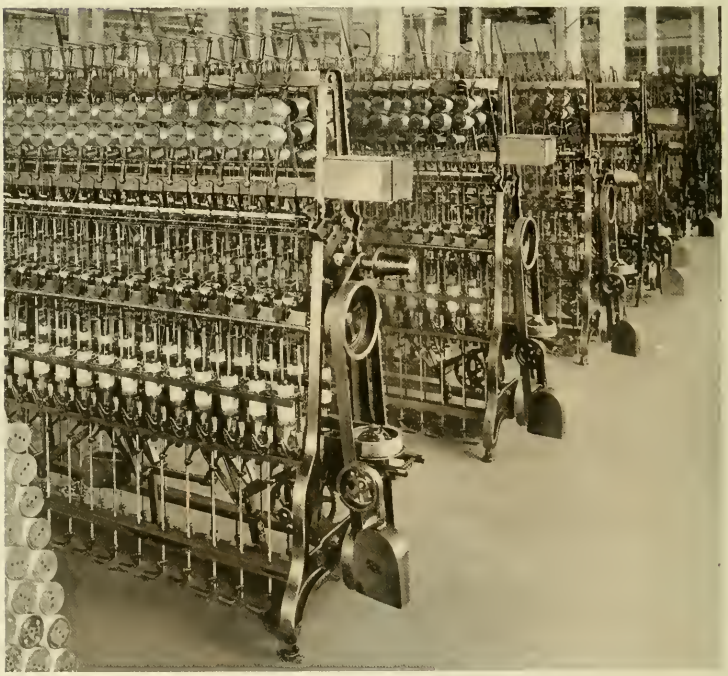
POPLINS

Nashawena poplins, both two-ply and single, have become standards in the trade for the better grades of dress and shirting fabrics. Owing to the large number of twisters, two-ply poplins are produced in very large quantities. They are noted for the superiority of their quality and the uniformity of their manufacture.

LAWNS AND ORGANDIES

The mills were planned to make a range of high grade lawns and organdies as a specialized part of their product. Their spinning equipment is such that they can supply the weave rooms with cotton yarns, both frame and mule spun, ranging from 60s to 140s in number.

Silk Quillers, Nashawena Mills



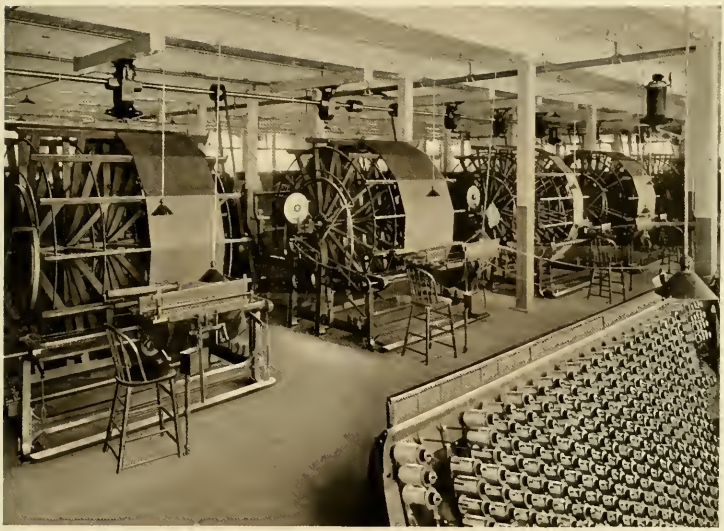
Some Silk-throwing Frames, Nashawena Mills

MECHANICAL FABRICS

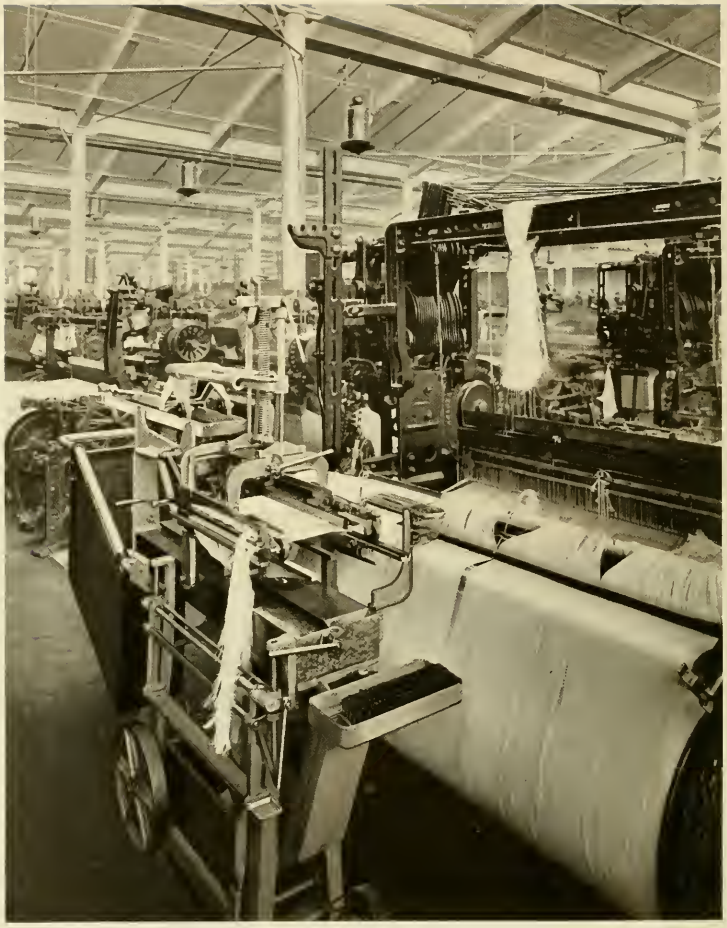
This modern term is applied to fabrics of peculiar characteristics, such as unusual strength with extreme thinness, non-stretching property, resistance to tearing strain and abrasion, etc. Great necessity for such material was created by the war, particularly in the form of cotton cloth for aeroplanes, balloons and gas masks. Quality was a matter of life and death, and the fabrics had to pass tests to which no textiles ever had been subjected.

The Nashawena Mills were perhaps the largest producers for the government. According to government experts, the quality of their product was unsurpassed by any that was manufactured in that time of strenuous effort. To assist in this result, William Whitman Company, Inc., established a central testing laboratory with every known modern apparatus for both test and research.

It has been retained as a regular part of the system which serves all the mills, and it remains especially valuable for the production of mechanical fabrics whose use is developing greatly in normal industry. Among these are many cloths which are essentially mechanical fabrics although not so called hitherto. Corset cloths, for example, require tensile strength as a primary element, and the standard of



A Section of the Great Silk-warp Room, Nashawena Mills. The silk department of this cotton mill would represent a respectable silk mill if it stood alone



Warp and Tying-in, Nashawena Mills

One of the Silk Rooms in the Nashawena Mills. Winding silk from skeins to tubes

strength is increasing continually. Shoe cloths which take the place of leather in certain kinds of shoes, present problems that become more exacting steadily as the demands increase for wearing quality, strength and other properties that are difficult to attain. Nashawena Mills corset and shoe cloths, which always have had high reputation, have the advantage of the discoveries and equipments that were created by the intense efforts during the war.

DESIGNS

As the Nashawena Mills specialize in executing designs and ideas, the designing department is, naturally, maintained as an important part of the establishment, and its staff is competent to bring out in weft and warp the beauty for which the designer strives.

A controlling part of the system in this department, as in the whole mill, is the protection of all ideas. Since costly sales campaigns so often depend on the exclusive novelty or distinction of a certain design or construction, the mills have developed this particular point to a degree where the safeguard is absolute.

Mules at Nashawena Mills

NASHAWENA MILLS

Fine Cotton and Cotton and Silk Fabrics in the Gray. All Fabrics are made of Fine All-combed Cotton Yarns, or All-combed Cotton Yarns in Combination with Silk.

Voiles for dress waist embroidery and curtain fabrics. Made in varying widths, weights and constructions, of single or ply yarns, with plain or fancy weaves, or with silk or colored yarn decorations.

Poplins for dress and shirting fabrics. Made in varying widths, weights and constructions, both single and ply yarns and of differing ply yarns in plain or Jacquard weaves, or with silk or colored yarn decorations.

Venetians and Sateens for linings. Made in varying widths, weights and constructions, both ply and single yarns, in plain or Jacquard weaves, or with silk or colored yarn decorations.

Lawns and Organdies for dress and waist fabrics. Made in varying widths, weights and constructions.

Plain Canton and Tussah Filled Fabrics. Made in varying widths, weights and constructions, in plain dobby and Jacquard weaves, with or without silk or colored yarn decorations.

Marquisettes for dress and curtain fabrics. Made in varying widths, weights and constructions, in plain or fancy weaves, or with fancy decorations.

Crepes for kimonos and dress fabrics. Made in varying widths, weights and constructions, in plain or fancy weaves, with silk or with silk or colored yarn decorations.

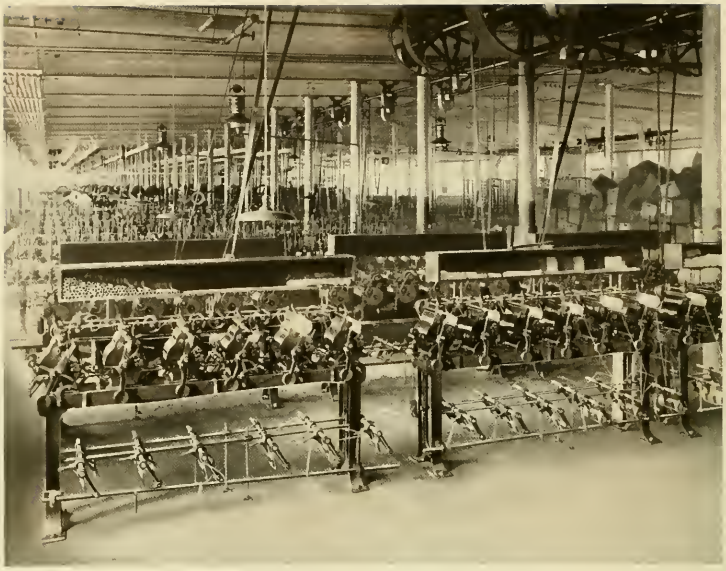
Silk Warp Fabrics for dress fabrics, made in varying widths, weights and constructions, in plain, fancy or Jacquard weaves.

The above fabrics are of more or less staple character and are used as the ground-work for many fancy styles made on special contract and confined to customers.

Special contract work is an important feature.

Katama Mills

Lawrence, Mass.



Winding Machines in the Katama Mills. One of the many steps in preparing yarns for the big looms

KATAMA MILLS

LAWRENCE, MASS.

Capital Stock.....$2,000,000

OFFICERS

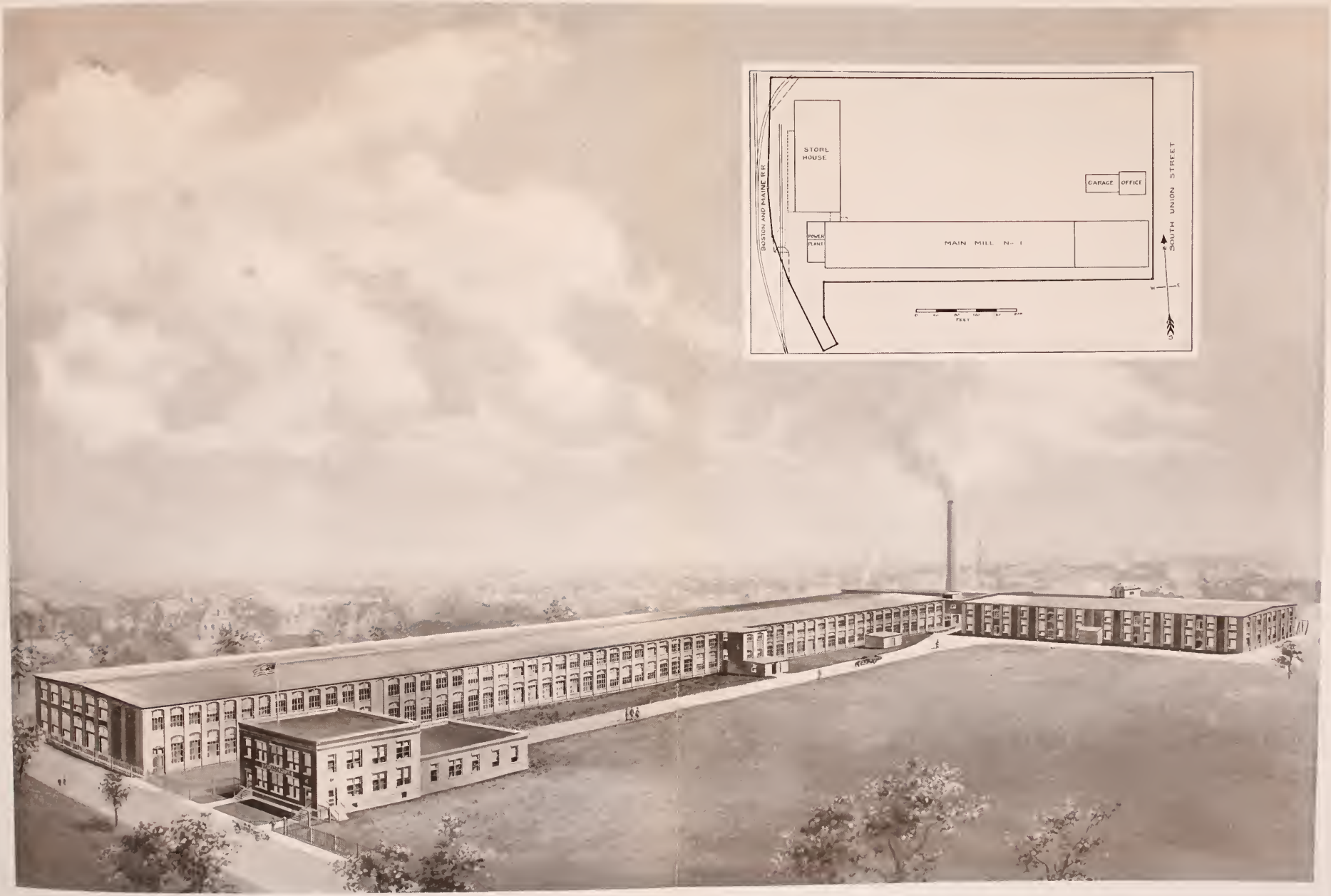
President: HENDRICKS H. WHITMAN.....Boston, Mass.
Treasurer: WALTER C. BALLARD.....Boston, Mass.
Clerk: FRANK C. CHAMBERLAIN.....Boston, Mass.
Agent: JOHN W. ALEXANDER.....Lawrence, Mass.

DIRECTORS

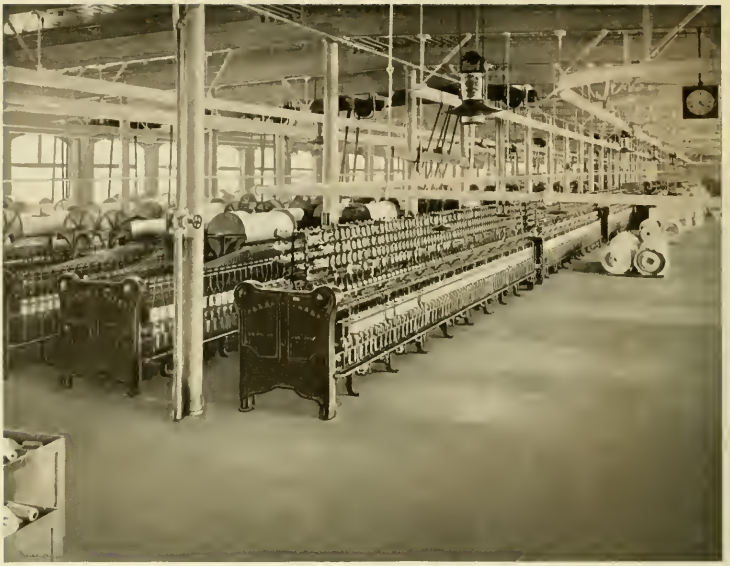
WALTER C. BALLARD.....Boston, Mass.
ARTHUR T. BRADLEE.....Boston, Mass.
LOUIS H. FITCH.....Boston, Mass.
FRANKLIN W. HOBBS.....Boston, Mass.
GEORGE H. WATERMAN.....Boston, Mass.
HENDRICKS H. WHITMAN.....Boston, Mass.
MALCOLM D. WHITMAN.....New York, N. Y.
WILLIAM WHITMAN, JR.....Boston, Mass.
WILLIAM WHITMAN.....Boston, Mass.

SELLING AGENTS

WILLIAM WHITMAN COMPANY, INC. Offices: 78 Chauncy Street, Boston, Mass.; 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.



The Katama Mills



KATAMA MILLS. SOME OF THE TWISTING MACHINES. OVERHEAD TROLLEYS CONVEY ALL HEAVY MATERIAL THROUGH THE VARIOUS DEPARTMENTS OF THE PLANT

KATAMA MILLS

LAWRENCE, MASS.

The Katama Mills were created and are equipped to produce heavy cotton fabrics for purposes demanding extreme strength, durability and "massiveness" of construction.

The concentration of regular effort is on Tire Fabric. The dominant principle of organization is readiness to meet the swiftly increasing challenges of motorized transportation.

The mills make Tire Fabric in all serviceable kinds and qualities, from Egyptian and American Cottons, both Combed and Carded, in all standard weights, widths and lengths, and are prepared to make any heavy fabric of any special construction.

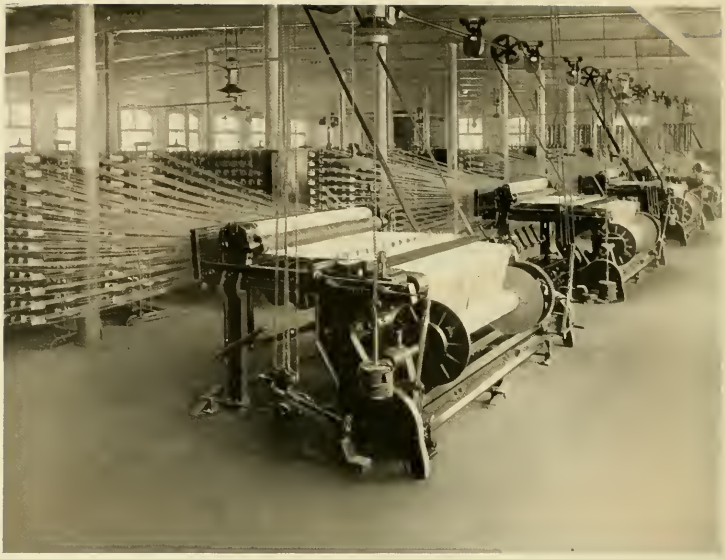
TIRE FABRICS

Practically every tire made in the United States is sold on one single argument—durability. This competition on the basis of Quality (the one form of competition that can never be carried too far, because it benefits the world increasingly) makes demands on the tire-producing technician that would have been considered absurd a few years ago; yet almost each day sees a further demand as one sweeping guaranty follows another.

To make good these guarantees, the tire-maker depends helplessly on the most tenuous and tender of things—the bloom of the cotton-plant. To fulfill the manufacturer's pledge of mileage and other service for his tire, the cotton expert must so manipulate his material that from a fluff nearly as fragile as vapor there shall grow a fabric competent to defy tearing, breaking and abrading violences actually beyond many to which iron was subjected fifty years ago.

Extraordinary as is the powerful fabric produced under this modern stress, its power can be obtained in only one way—by excellence in spinning the same delicate cotton yarn as that which goes into the most gossamer material. If that original yarn be not as perfect as good raw material and skilled manipulation can make it, the defect will run through the hundreds of processes that lead to the finished fabric.

Therefore the successful production of tire yarn demands a close combination of two qualities—long experience in regular yarn making, and up-to-date knowledge and methods that are smartly abreast of the modern development.



Warp Compressing Machines, also known as Beamers. These prepare the huge warps for the weave room

View of a Weave Room, looking North, in the Katama Mills. Note the trolley system for handling the heavy rolls of cloth

The Katama establishment is so situated that it commands both these essentials. Itself wholly modern in construction and equipment for manipulation and weaving yarn into tire fabric, its membership in the Whitman Company group of mills gives it a supply of the best of tire yarns.

Bulk and weight being a formidable problem in manufacturing Tire Fabric, the Katama Mills are so arranged with overhead trolley systems that all handling is done by power, and the material passes through all its processes with complete directness from the original yarn to the delivery of the finished fabric on the shipping platform whence it passes immediately into the freight trains. The specially built automatic looms in many important respects differ from those used by any other mill in this field, and like all the Katama machineries are driven by individual motors. Their number is such as to make this mill probably the largest in the country to operate automatic looms on this class of work.

The time economies thus enjoyed by this modern mill are utilized for time-expenditures on what is the vital feature of a tire-fabric mill—supervision and continual test. The carefulness of tire yarn manufacture and inspection in the Whitman group of mills, has been described. Notwithstanding this, a Katama inspection goes over the same ground before a yarn starts on its course. Following this, the material is under unremitting expert watch through all the processes of twisting, beaming, weaving, etc., with the testing-departments checking all results. The finished product ready to ship must pass three final and wholly separate inspections, each covering the entire fabric, a final one being conducted during a slow passage of the cloth through the calendering rolls.

In addition, the central laboratory in No. 78 Chauncy Street, Boston, which serves all the mills in the Whitman group, reinforces the Katama system with its own independent tests of product and with laboratory exploration of ideas for advanced work.

KATAMA MILLS

TIRE FABRICS

BUILDER FABRIC

Carded American Cotton — Combed American Cotton
Carded Egyptian Cotton — Combed Egyptian Cotton
Combed S A K Cotton

CHAFING FABRIC

Carded American Cotton — Combed American Cotton

LENO BREAKER

Carded American Cotton

CORD FABRIC

Combed American Cotton — Combed Egyptian Cotton

In Widths..... 18, 54, 60, 72, 84 and 90 inches
In Rolls..... 125, 250 and 500 yards
In volume large enough to warrant, specialties will be made

Some of the Testing Apparatus in the Central Laboratory in the William Whitman Building, 78 Chauncy Street, Boston

The Central Testing Laboratory in the Boston Building of William Whitman Company, 78 Chauncy Street, Boston

The Calhoun Mills, Calhoun Falls, S. C.

CALHOUN MILLS

CALHOUN FALLS, SOUTH CAROLINA

Capital Stock..... $600,000

OFFICERS

President and Treasurer: JAMES P. GOSSETT, Calhoun Falls, S. C.

Secretary and Assistant Treasurer: E. M. LANDER, Calhoun Falls, S. C.

DIRECTORS

W. F. COX..... Calhoun Falls, S. C.

GEORGE A. DRAPER..... Hopedale, Mass.

JAMES P. GOSSETT..... Calhoun Falls, S. C.

E. M. LANDER..... Calhoun Falls, S. C.

H. T. CRIGLER..... Calhoun Falls, S. C.

E. KENT SWIFT..... Whitinsville, Mass.

WILLIAM WHITMAN..... Boston, Mass.

SELLING AGENTS

WILLIAM WHITMAN COMPANY, INC. Offices: 73 Chauncy Street, Boston, Mass.; 25 Madison Avenue, New York, N. Y.; 300 Chestnut Street, Philadelphia, Pa.; Continental and Commercial Bank Building, Chicago, Ill.

CALHOUN MILLS

CALHOUN FALLS, S. C.

The Calhoun Mills, of Calhoun Falls, S. C., was incorporated in 1907, to manufacture staple carded print cloth yarn fabrics.

The mill is situated in a splendid manufacturing district where there is an ample supply of good grade average strict middling upper Carolina cotton. The machinery is modern and up-to-date in every respect. The mill is equipped with Draper Automatic Looms and every other manufacturing facility used for the manufacture of staple carded fabrics. No effort has been spared to maintain healthful conditions not only in the mill but in the homes which the corporation has provided for its employees. In addition, the management has established every means to enable the employees to obtain economically all their clothing, food and other household supplies that they may require, and has made such improvements in the nature of welfare work as would tend to make the community an ideal one for the employees.

The mills were planned especially to spin their own yarn from cotton grown in the surrounding district and to weave this yarn into plain staple fabrics. It has been the aim of the management to utilize only the best grades of cotton of the character required and to specialize on one or two constructions of fabrics with the idea of perfecting their manufacture. The result has been that from the time the mill was incorporated it has produced fabrics of unusual merit. The gray fabrics of the Calhoun Mills are of as high a standard of quality as those manufactured anywhere in the United States. The character of the cotton, the quality of the yarn, the careful weaving, and the conditions under which the employees work, have enabled the mill to produce cloths that are not only of the best quality and uniform in quality but of unusual strength and cleanness. In fact, for certain purposes where strength and careful sizing are necessary elements, these fabrics are preferred.

The gray fabrics produced by the Calhoun Mills have won an enviable reputation in the trade and command a preference in the market. They are sold to the converters who bleach, dye or print them into many different cloths. The finished fabrics in their different forms are used in almost every kind of cotton article.

COTTON STORAGE

Belleville Warehouse Company

New Bedford, Mass.

To meet their own needs and also for general use for the cotton industry, the Manomet Mills, Nashawena Mills, Nonquitt Spinning Company and William Whitman, in 1916-1917 formed the Belleville Warehouse Company which erected a fire-proof, flat slab, reinforced concrete 8-story building with 750,000 square feet storage area for receiving, storing and delivering cotton and other merchandise. It enables mills to buy and keep on hand supplies of cotton for future requirements and thus assure themselves of their raw material in times of uncertain shipping and delivery conditions.

Negotiable warehouse receipts will be furnished on which loans may be obtained under favorable terms, thus reducing the carrying charges to a minimum.

A railroad siding, with a capacity of thirty-one cars, runs the entire length of the building. Adjacent to this siding is a covered platform, eight feet wide, for loading and unloading. Elevators and

Belleville Warehouse.

Length 964 feet; width 109 feet; storage area 750,000 square feet; floor load 150 pounds per square foot; siding capacity 31 cars; 8 elevators; 4 whip hoists; 4 spiral chutes; 8 stairways.

The construction contains 50,000 barrels of cement, 1500 tons of steel, 1,000,000 board feet of lumber.

whip hoists handle the merchandise quickly. Carloads of goods billed "Care of the Belleville Warehouse Company" arrive at the siding free of switching charges. Carloads of cotton arriving by boat at the New England Steamship Company's wharf at New Bedford may be shipped to the Belleville Warehouse at low cost.

The warehouse is equipped with sprinklers and divided into units on each floor by fireproof partitions. It is divided on each floor into sixteen sections each served by elevators and whip hoists for receiving cotton and by spiral chutes for delivery. The sections are numbered and the bays of each section are lettered. Consignments are kept together and received, stored, weighed, tagged and recorded under the best warehousing methods, keeping close record of every bale.

THE object of this book has been to state the character that dictates the quality standards of the William Whitman Company, Inc., organization and to indicate in a broad way how the standards are realized in finished product. It is impossible in any work of this kind to give a detailed description of the goods the various mills regularly manufacture or those other goods that they could, if necessary, rapidly turn their machinery to in times of stress or national emergency such as the late war, at which time, through a correlation of the various plants and the numerous textile connections of the Company they were able and did offer to the Government, rapidly and in large volume, textile goods covering nearly all the national requirements. The mills, furnished as they are with every known form of useful equipment installed for large production, together with the correlated business organization of the Company and its mills, place the Company in an unusually strong position to meet individual or national needs either for the standard goods which they ordinarily make or for special goods to meet emergencies or special requirements of the trade.

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